

concrete construction

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All who are concerned with quality, JOB PLACED CONCRETE (including prestress, tilt-up, lift slab, and thin-shell)—its production, handling, forming, reinforcing, placing, finishing, and curing: CONCRETE CONTRACTORS; GENERAL CONTRACTORS; INDUSTRIAL CONSTRUCTION AND MAINTENANCE MEN; ENGINEERS; ARCHITECTS; STATE HIGHWAY ENGINEERS; READY-MIXED CONCRETE PRODUCERS.

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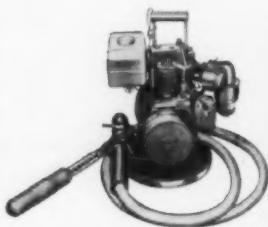
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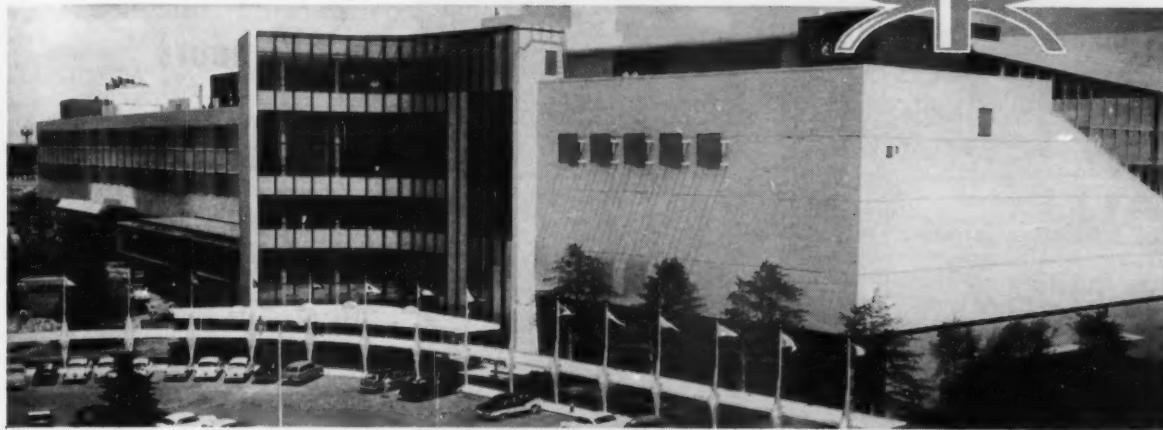
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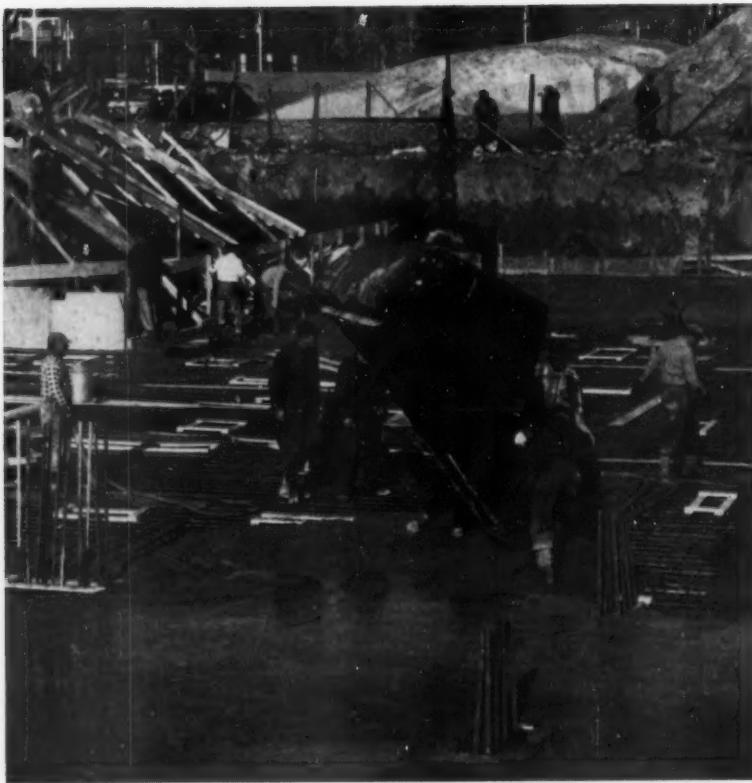
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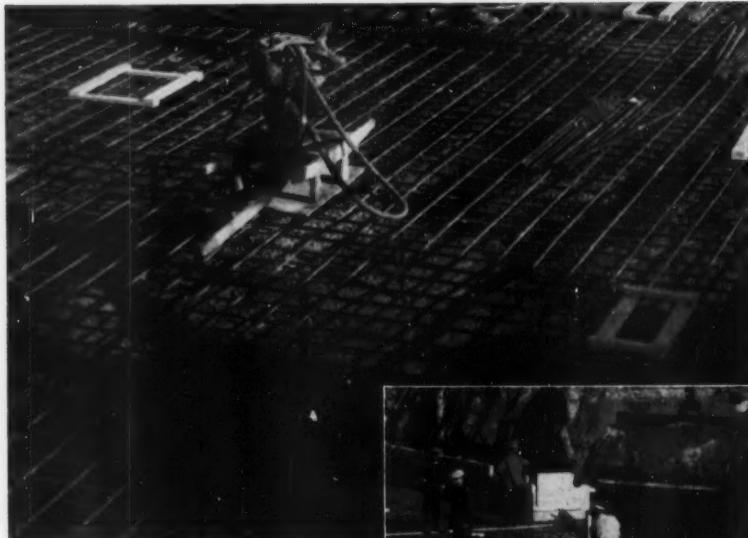
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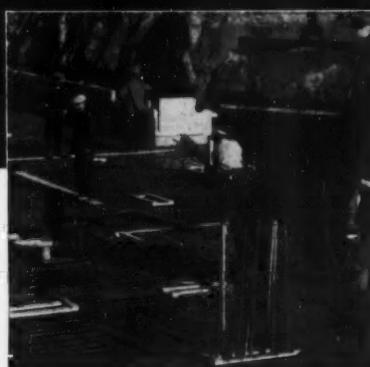


CHUTES AND BUCKET OPERATE simultaneously, pacing fast-working concrete placement crew on Senator Robert F. Wagner, Sr., Houses project in Manhattan. Starrett & Van Vleck, architects; Reginald E. Marsh, associate. Seelye, Stevenson, Value & Knecht, consulting engineers; George F. Driscoll Co. and Moccia Construction Co., joint-venture contractors. All are New York City firms.



UPRIGHT CHAIRS, set on 3" concrete mud mat, support top reinforcing for pressure slab. Placed on 6' centers, vertical chairs were held securely in place against bottom reinforcing by tie-wires.

BUCKET is brought close to reinforcing steel before discharge to reduce impact. Wood templates locate column dowels.



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How to pour 1526 cu. yd. pressure slab in 6½ hours

HERE'S HOW one shift poured a 5' thick, 8,200 sq. ft. concrete pressure slab, and went home 90 minutes early.

Problem of Manhattan traffic was solved by scheduling pour on a Saturday which also assured contractor of getting concrete supplier's entire output. Casting began at 7:00 a.m. at two diagonally opposite corners of the "T"-shaped 64' x 144' foundation where two batteries of 4 wood chutes permitted several truck mixers to unload simultaneously at each location. Two cranes with 2½ yd. lay-down buckets were spotted on corners opposite the chutes to handle additional transit-mix trucks. By late morning, work had progressed beyond reach of the chutes. The cranes continued closing in on the middle. They completed the 1526 cu. yd. pour at 1:30 p.m.—just 6½ hours after the first truck mixer unloaded.

The 30-man crew placed concrete at a fast 235 cu. yds. per hour clip with evenly paced delivery of properly mixed material by a fleet of 24 truck mixers. The only way to handle a big, continuous pour of this nature is to use truck mixers of certified design, capacity, mixing speed and water control accuracy.



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Weight reduction is a prime requirement

in more and more construction projects.

One way to accomplish it is by building floors with . . .

PERLITE CONCRETE FILL

MORE AND MORE of the nation's leading architects and contractors are today engaged in an all-out search for materials and methods with which to achieve economy in building. Out of this search a definite trend has developed toward lightweight floor construction as one of the most effective ways to keep costs down and at the same time improve the quality of the structure.

One of the more successful materials being used in lightweight floors is perlite concrete fill. Applied over various types of light structural forms including corrugated and ribbed steel, cellular steel floor units, ribbed metal lath and paper-backed wire mesh, lightweight perlite concrete fill results in a dead load considerably less than the rated live load.

Two interesting new buildings now under construction present excellent examples of the methods of application and the advantages of this type of design. They are the quality control and general office building of the Mallory-Sharon Metals Corporation, Niles, Ohio, and the administration building of the Lansing, Michigan, airport.

According to Donald Lloyd Bostwick, AIA, designer of the Mallory-Sharon building, a perlite-sand concrete fill was specified because it permitted a dead load saving of 690,184 pounds. This total includes weight savings over regular concrete as well as the savings in structural steel that resulted from the reduced floor dead loads.

The architect specified a three-inch perlite-sand concrete fill over steel decking welded to the framing system.

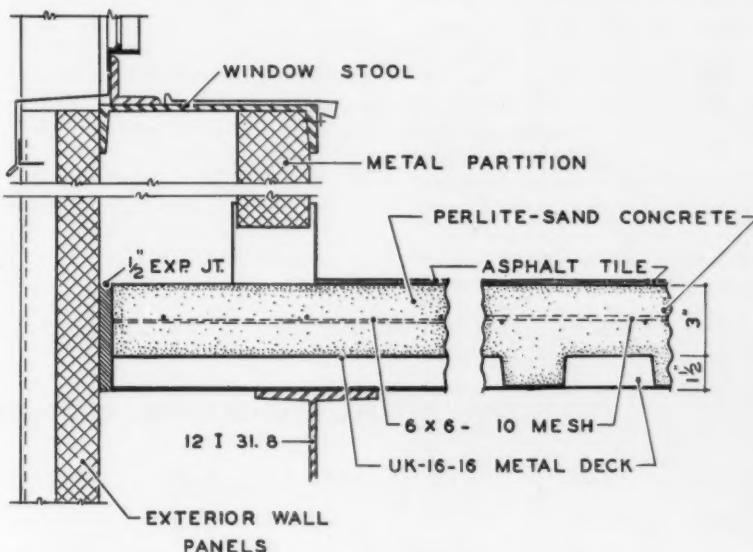
Floor ducts and conduits for electrical, telephone and other utility systems were embedded within the fill, which was specified for a minimum compressive strength of 900 psi.

F. Ivan Law Company, Youngstown, Ohio, was the concrete contractor who poured the 30,000 square feet of floor fill. The mix used was one bag of cement to one cubic foot of sand and four cubic feet of perlite concrete aggregate.

The 1½-cubic yard batches consisted of 8 bags of cement, 8 cubic feet of sand and 32 cubic feet (8 bags) of perlite concrete aggregate. To this was

added 72 gallons of water and two pints of air entraining agent. The mixing time was seven minutes at 16 rpm.

The perlite-sand concrete was elevated to the second floor through a window by a bucket and tower arrangement, then dumped and transported to the point of application in motorized buggies of 10-cubic foot capacity. The lighter weight of the perlite concrete mix is said to make it easier and faster to apply, resulting in significant labor savings. When finished by steel trowelling, the perlite-sand concrete was covered with asphalt tile.



**DETAIL OF FLOOR SYSTEM
USING LIGHTWEIGHT PERLITE-SAND CONCRETE**

"Since the lightweight perlite-sand concrete weighed approximately 55 pounds per cubic foot against 144 pounds per cubic foot for regular concrete," the architect reports, "there was a weight saving of over 22 pounds per square foot of the three-inch slab."

Another consideration, Mr. Bostwick adds, is that the perlite-concrete has good sound-deadening properties, an important efficiency factor in a building where exacting research is carried out.

Now nearing completion, the new 4-story airport terminal building at Lansing, Michigan, also features perlite-sand floor fills to lighten the weight of the structure and contribute to the fireproofing of the building. This project demonstrates the application of perlite-sand concrete over a metal pan deck. The mix design called for 1 bag of cement to three cubic feet of perlite concrete aggregate and two cubic feet of sand. A total of 125 cubic yards of the mix was poured to a floor thickness of three inches. The building was designed by Louis C. Kingscott & Associates, Kalamazoo, Michigan. Norstrom & Myers, Lansing, Michigan, is the general contractor.

General Application Techniques

Perlite concrete floor fill in composite structural systems not only permits substantial weight savings compared with regular concrete but cuts costs by reducing the erection and removal of concrete forms. It also represents at least a 40 percent weight saving over the use of heavier expanded aggregate concrete floor fills. According to the Perlite Institute, the perlite industry's international trade association, perlite-sand concrete fill can be applied without any topping, which is an expensive "must" for some types of concrete fill. In addition to being a one time application, the substantially lighter perlite-sand concrete is reported to be faster and easier to handle.

Perlite-Sand Concrete Mixes

There are actually several popular perlite-sand concrete mixes that are used to obtain different compressive strengths ranging from 700 to 1,500 psi. These blends are easily specified. Finished like ordinary concrete, they will produce floor fills with a dry weight between 50 and 75 lbs. per cubic foot—or from one-third to one-half the weight of ordinary sand-gravel concrete.

The mix proportions and other data for perlite-sand mixes shown in the accompanying table are typical of the results encountered on the job by member companies of the Perlite Institute. Of course, contractors planning to use perlite-sand floor fills should consult their aggregate supplier for recommended mix proportions for any specific application.

Ready Mixed Perlite Concrete

Ready mixed concrete is very definitely in the perlite picture. When transit mixing perlite concrete for the first time, it is suggested that the perlite manufacturer be consulted for suggestions as to the correct mixing time and procedure. These may vary with the type and age of locally available equipment.

The mixing procedure used by many transit mix operations is as follows:

- (1) Determine the load, based on the mixer rating as shown on the name plate.
- (2) Add to the mixer the correct amount of water for the load, leaving out about 30 gallons.
- (3) The correct amount of air entraining agent and cement is added to the mixer and mixed until a slurry is formed.
- (4) Add the correct number of bags of perlite concrete aggregate and then, while the truck drum is revolving, slowly add the last 30 gallons of water to insure that all the perlite is in the mix. If the drum is rotated between plant and

job it should be rotated at slow speed.

- (5) Upon arriving at job, mix at top speed for not less than 5 or more than 30 minutes. Check wet density for conformance to specification range, dump and place immediately.

When mixing perlite concrete in regular paddle type mixers it is generally mixed for about 3 minutes in a 40 rpm mixer to achieve the proper wet density and workability. It is therefore suggested that 100 to 120 revolutions of the transit mixer drum should give good perlite concrete. Experience indicates that high-discharge type truck mixers have some advantages in handling perlite concrete.

If desired, the drum can be charged with water, air entraining agent and cement at the batching plant, and the perlite aggregate can be added at the job site, mixing at high speed until the desired density and consistency is reached.

Care must be taken to ensure proper mixing time for the perlite insulating concrete. Using the correct amount of water as specified, the perlite concrete should have a slump of approximately 7 inches when properly mixed and may appear too wet by normal concrete practices. However, if the mix appears too dry or stiff, the mixing time has probably been too short. Continue mixing until the desired plasticity is reached. Extra water and under mixing may reduce the yield.

The first truck load of perlite concrete will usually discharge about one-third of a yard short since this quantity will coat the inner walls of the truck drum. However, this will not occur in subsequent loads, because the walls will be coated sufficiently. After discharging the last load, 7-10 gallons of water may be added to the revolving drum to wash out this coating and this "soupy" mixture dumped and blended with other concrete from the previous load. This will not impair the perlite

TYPICAL PERLITE-SAND CONCRETE MIXES

Cement (sacks)	Perlite (cu. ft.)	Sand (cu. ft.)	AEA (oz.)	Water (gal/sack)	Cement factor 100% yield	Density wet	Density dry	Compression 28-day, psi
1	4	1	8	9	5.4	60	50	700
1	3	2	12	8.2	5.87	83	69	1005
1	2.4	1.5	10	8.1	6.8	84	74	1230

RIGHT: Airport terminal floors are formed for three-inch thick perlite-sand concrete floor fill applied over a metal pan deck. This photo shows the screeding operation. When dry the floors will be finished with a variety of surfaces including asphalt tile, vinyl tiles, terrazzo, and quarry tile.



concrete properties because the excess water bleeds out without loss of cement.

Wire fabric reinforcement is recommended for all types of perlite concrete floor fills except where wire fabric is incorporated as part of the forming material.

Many contractors prefer high early strength portland cement in order to speed up finishing operations, to minimize the chances of damaging the slab before it has set, and to prepare the floor for traffic at an earlier date.

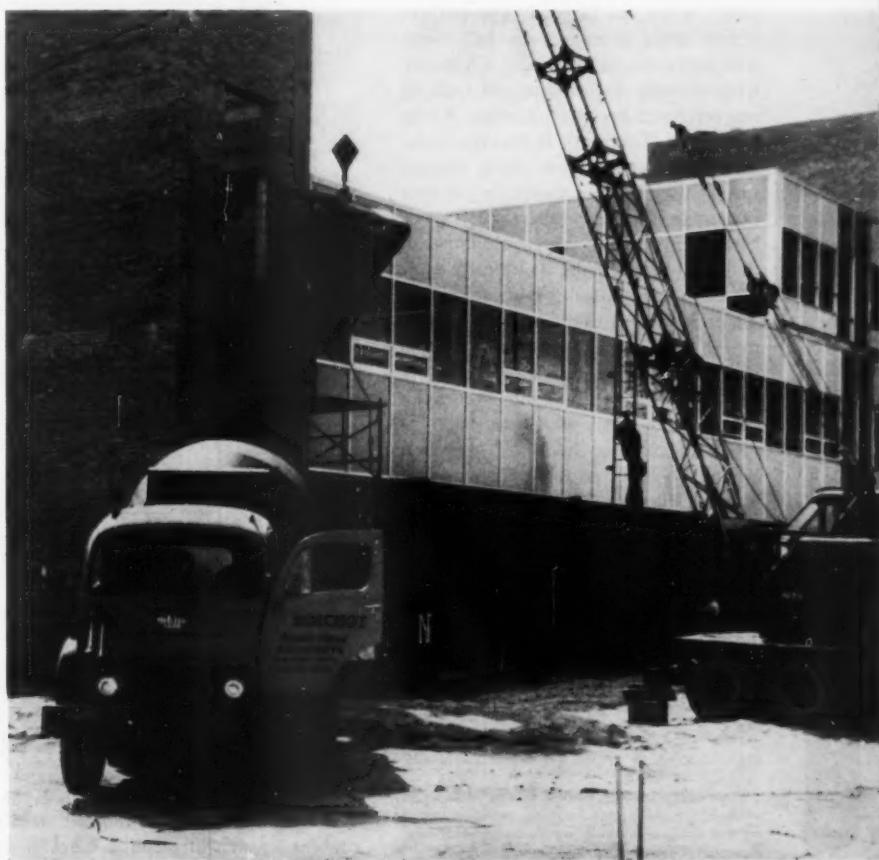
Another point to keep in mind is that all perlite-sand concrete floor fills should be protected for at least the first three days to keep them from drying out too rapidly or freezing.

The recommended method of finishing perlite concrete is steel trowelling which produces a smooth hard finish to receive the final floor covering.

Finally, expansion and contraction joints should be provided at all junctions of floor and walls, and transverse expansion joints should be installed across every 100 lineal feet of fill.

END

BELOW: Transit mixed perlite-sand concrete floor fill is shown being hoisted to the second floor of the new Airport Terminal Building of the Lansing, Michigan, airport. Scheduled for completion this fall, the new structure features perlite-sand concrete floor fills as a weight-saving material that also contributes to the fire-proofing of the building.



Readers who would like to have additional information on the subject discussed in the foregoing article may request it by filling out one of the reader service cards in this issue.

This is the second installment of a two-part article designed to lay some groundwork for better understanding of . . .

SOIL AND SOIL MECHANICS*

BACKFILL

Probably the most common example of poor practice in handling soil is the careless backfilling of trenches. Everyone will know examples, either in his own garden or in his own locality, of backfilled trenches which have settled, leading to hollows which clearly mark the route followed by the trench. When these cut across finished roads, they can often lead to serious trouble. All such trouble can be easily avoided.

The usual procedure in backfilling trenches is to put back the soil either with shovels or machinery, without any reference to its state when it was excavated. The result is that the backfilled soil is not as dense as the original soil. This is usually shown by the fact that there is some excavation left over. Nature proceeds to correct the mistake that has been made, and the backfill gradually consolidates with time and under the pressures that may be applied to the surface of the trench. As the soil in the trench shrinks, it gradually becomes more dense, and eventually causes the hollows which are so common a feature of backfilled trenches.

The whole secret of avoiding trouble in backfilling trenches is to get the soil back in place at approximately the same density as it had before it was removed. How can this be done? In the case of sand and gravel, this result can be achieved if the material is replaced in trenches in thin layers, if it is properly compacted and vibrated as it is placed, and if it is actually flooded with water when this is necessary. This last procedure must be done carefully

since, if not enough water is used, the sand may be just dampened and this leads directly to bulking of the sand with subsequent settlement when it dries out.

It is more difficult to get satisfactory results with fine-grained soils or with soil mixtures. Here is where soil mechanics can be of very practical assistance to the builder. The graph in

Figure 3 shows in the simplest possible way what happens if you take a certain amount of a particular soil and place it repeatedly in the same box in the same way, changing the amount of water in the soil (or its water content) each time you repeat the experiment. All soils behave in a similar way. The graph shows the way in which the dry weight of the soil

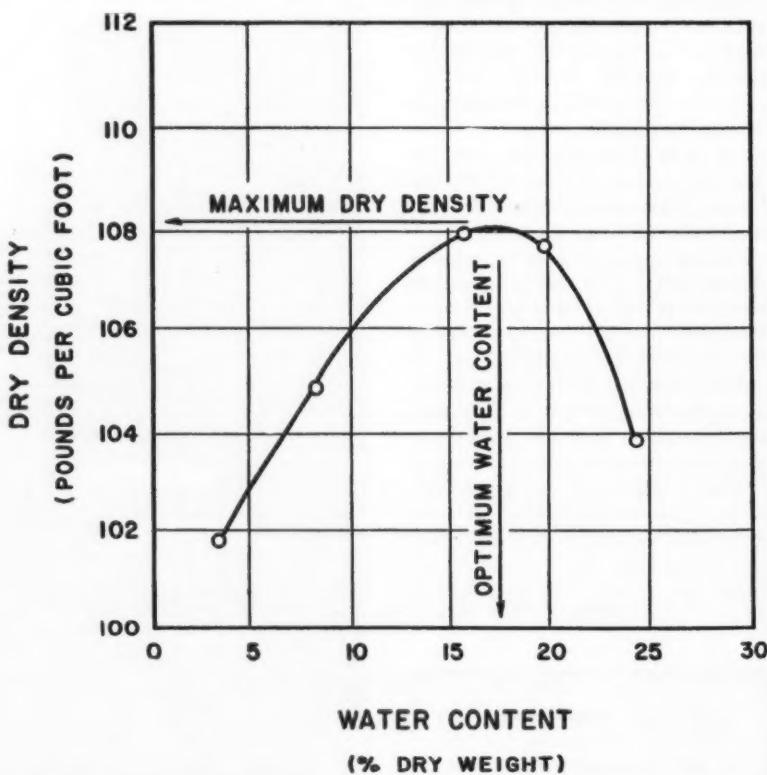


FIGURE 3. This graph shows how the dry weight of soil changes as more and more water is added to the soil. It is always desirable to place soils at a water content which will result in backfill of maximum density.

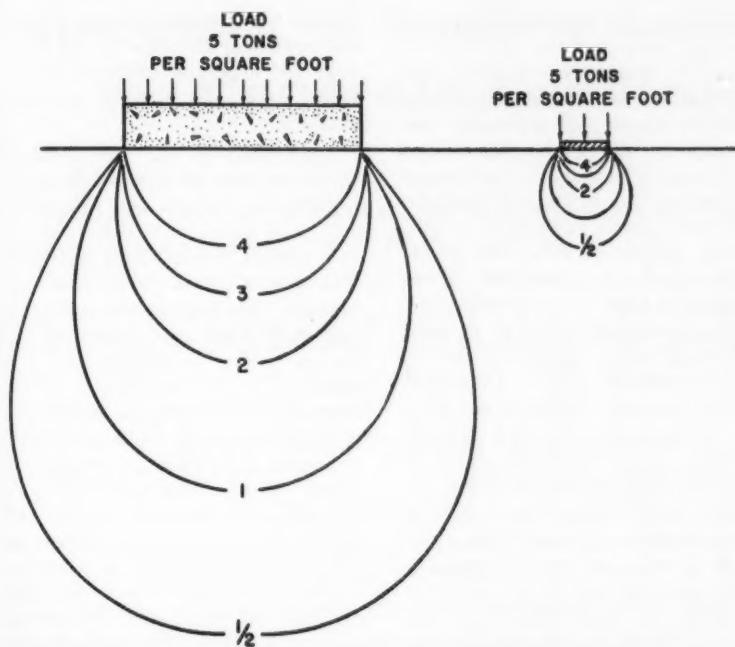


FIGURE 4. Except in those rare instances in which footings may be placed on solid rock, soil of some kind must carry all structural loads. These diagrams show the relationship between soil stresses at various depths for the same unit load imposed on a small area (shown at the right) and on a large area (shown at the left). Soil conditions should be studied to a depth of at least twice the width of any structure which is to be placed on the soil.

changes. At first the addition of more water helps the particles to move closer together, as the soil is compacted in position. The result is that more and more soil particles are forced into the same volume and so the density increases. Once a certain critical point is passed, however, no more soil particles can be put into the space. The extra water which has been added will now gradually displace some of the soil solids, with the result that the dry density of the soil in the box begins to decrease. It is clear that, when placing soil, it should always be placed in position at a water content which will result in a density as close as possible to the maximum density similar to that shown in this graph.

Fortunately, it is not necessary to conduct a laboratory experiment whenever soil is going to be used in this way. There is a very simple way to determine roughly the optimum water content at which this maximum density is obtained. For some soils, this point can be distinguished by mixing small quantities of the soil with water and testing them by squeezing a lump of the soil in the hand. When the soil is of such a consistency that it will just break up into smaller lumps when

pressure is applied to it, this indicates the right amount of water in the soil to give optimum density.

When backfilling trenches, therefore, if the soil to be used is not sand and gravel, it should be subjected to this simple test.

Every effort should be made to protect the material excavated and to keep it in its natural state. Covering it with tarpaulins to reduce evaporation is useful. If it is found, however, that the water content of the soil should be changed then, as the soil is backfilled, it should be allowed to dry or be mixed with enough water to bring all the soil to the proper consistency. It MUST be placed in thin layers, not more than 6 inches thick. Each layer must be properly compacted by a heavy rammer or by one of the simple mechanical rammers now available on the market.

If this process is carefully followed, it is possible to backfill trenches, even quite large ones, so that no appreciable settlement of the surface occurs. Many highway departments have placed embankments up to 100 feet high, following methods of compaction as outlined above, and have immediately placed permanent pavements upon

them knowing that no disrupting settlement is going to occur because of the proper application of soil mechanics techniques.

FOUNDATIONS ON SOIL

For all structures other than those which are founded on solid rock, soil is the bearing medium that carries the load which the structure imposes. Such loads do not disappear mysteriously into the soil, but set up stresses and cause strains in the soil in just the same way as loads do in more common structural materials. Because the structure imposes a load on a large mass of soil, the load is quickly dissipated in the soil. The way in which this happens can be calculated and so it is usually possible, if the soil properties are known, to determine in advance how the soil will react to loads that are going to be placed upon it.

If we place a load of 5 tons on a small steel plate, say 12 inches square, the soil immediately under the plate will be subjected to a stress of 5 tons per square foot. Two feet below the plate the load will have been spread over an area of about 10 square feet so that the average stress will have decreased to about half a ton per square foot. The way the load is distributed within the soil is illustrated in the smaller of the two diagrams in Figure 4. If now we place exactly the same unit load of 5 tons on every square foot of a big concrete slab, as shown in the other diagram, the same pattern stress occurs but the depth to which soil will be stressed is now greatly increased. These two diagrams show: (1) How misleading a loading test on a little plate can be if there is weak soil below the surface; and (2) How vitally important it is to know exactly what the soil conditions are to a depth of at least twice the width of any structure which is to be placed on the soil.

Naturally some soils are much stronger than others. The strongest are sands and gravels, which provide excellent bearing for all ordinary foundations. Some clays, however, are not very strong, and will actually compress under quite small loads. Whenever large structures have to be placed on such weak soils, special soil investigations should be made to ensure that serious settlement does not take place.

Settling of structures built on clays may be caused by another reason. The clay may be strong enough but if roots of trees or other vegetation start to

extract water from the clay beneath the surface, it may shrink and lead to settlement of the building. This will make itself evident in dry weather when tree roots, in particular, will travel long distances in their search for water. In regions where this type of settlement is common it is necessary to carry the building loads to a considerable depth or to avoid or remove trees.

Another common difficulty with soil, which often shows up as cracks in buildings is found when a structure is built partly on natural soil and partly on filled ground. This is a dangerous procedure unless the greatest care is taken to make absolutely certain that the filled ground has exactly the same properties as the natural soil which has not been disturbed.

When soils containing water are frozen, the soil mass usually expands. For this reason footings should never be founded on frozen soil. During and after construction special precautions must be taken to prevent freezing of the soil below footings. In cold regions it is most important that unheated structures such as garages and porches be unattached to main buildings unless there is complete assurance that the subsoil does not expand when frozen.

Many needless failures of foundation walls occur every year. Most of these failures are due to improper drainage. An ordinary foundation wall is not strong enough to act as a dam and the groundwater must therefore be removed as shown in Figure 1. Many other failures are caused by backfilling around an unsupported wall or by allowing heavy construction machinery too close to a wall. For this reason backfilling should not proceed until the foundation wall is supported, top and bottom. It is good practice to keep all construction equipment at a distance from a wall equal to its depth.

SIMPLE SOIL INVESTIGATIONS

From the foregoing it will be clear that, no matter how simple a construction job may be, it is essential to know the soil conditions that are going to be encountered. This involves not only looking at the surface but also finding out about the soil conditions and the groundwater conditions beneath the surface, to a depth greater than twice that to which building operations are to be carried out. Fortunately, this can be done very easily and at very little expense.

In the case of very shallow investigations, some information can be gained by merely probing with a steel rod, but this is not very satisfactory. The best simple soil exploration can be made by drilling a number of holes on the site with a simple hand auger. Special soil augers are now available but if one cannot be obtained, a satisfactory job can be done with an old ship's auger such as are used by carpenters. If holes are thus drilled, and the auger carefully removed, its blade will bring with it samples of the soil that has been penetrated. These samples can then be studied in the hand. If the resulting holes are carefully watched, some idea can be gained of the local groundwater conditions.

For more thorough investigations, test pits can be excavated. This is normally a cheap and simple operation, unless the pits have to be carried to great depth. Even with deep pits, however, when special shoring is necessary, it may be found cheaper to explore soil conditions in this way than to bring in special boring equipment.

These are simple methods which can be used to study the soil conditions at a building site. If, for any reason, it is found necessary to go beyond these methods, then expert advice must be sought. Fortunately, such advice is now widely available. It is recom-

mended that whenever any unusual soil conditions are suspected, or when large and important structures are involved, expert advice should always be obtained.

Some study of the soils involved should be made on every single building job. It is hoped that this article will be of assistance to those who are in a position to make such studies on their own, when no complications are involved. The engineering and scientific study of soils, now called soil mechanics, is not an abstruse and academic subject of interest only in the laboratory, but it can be one of the most practical aids available in construction. For those to whom the reading of this article has served as an introduction to the study of soils, and who wish to know more about the subject, the following list of references may be of interest. There are now available excellent books devoted entirely to the engineering study of soils, to which this discussion is only an introduction.

END

Readers who would like to have additional information on the subject discussed in the foregoing article may request it by filling out one of the reader service cards in this issue.

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8. Peck, R. B., Hanson, W. E., and Thornburn, T. H., **Foundation Engineering**. John Wiley and Sons, New York, 1953, 410 pp.
9. **Guide to the Field Description of Soils**. National Research Council of Canada, Associate Committee on Soil and Snow Mechanics, A. C. S. S. M. Technical Memorandum 37, NRC 3813, December 1955.

Directory of Testing Laboratories for Concrete Construction Materials

Testing of construction materials and soils has become increasingly important with the postwar growth of the construction industry and the new standards imposed by more stringent building codes. Costly errors and disastrous failures can be prevented by proper testing procedures.

Where can these tests be made?

To provide an answer to this question CONCRETE CONSTRUCTION has compiled a chart of laboratories in the United States which offer testing services in the field of concrete construction. The laboratories listed are all members of the American Council of Independent Laboratories, Inc. The geographical arrangement of the chart provides ready access to the address of the nearest laboratory which can assist you in testing

the materials you use and the soils on which you build.

Each of the laboratories is equipped to carry out ordinary tests to determine the compressive and flexural strength of concrete. In addition, the majority of the establishments can also conduct all or most of the standard test procedures in connection with cementitious materials for concrete, aggregates for concrete, mortar for unit masonry, masonry building units, soils, waterproofing and roofing materials, investigations of foundations, and road and paving materials. However, since there are some exceptions, it is suggested that readers determine the availability of such services by getting in touch with the nearest office of one of the testing organizations listed below.

ALABAMA

Law Engineering Testing Co.
2920 7th Ave. South, **Birmingham**
Southern Testing Laboratories, Inc.
2227 First Ave. South, **Birmingham**
Barrow-Agee Laboratories, Inc.
1010 Ferry St., **Decatur**
A. W. Williams Inspection Co.
208 Virginia St., **Mobile**
Southern Testing Laboratories, Inc.
Montgomery

ARIZONA

Arizona Testing Laboratories
817 West Madison St., **Phoenix**

ARKANSAS

Barrow-Agee Laboratories, Inc.
403 Victory, **Little Rock**

CALIFORNIA

Hornkohl Laboratories
714 Truxtun Ave., **Bakersfield**
California Testing Laboratories, Inc.
619 East Washington Blvd., **Los Angeles**
Smith-Emery Company
781 East Washington Blvd., **Los Angeles**

United States Testing Co., Inc.
1723 S. Maple Ave., **Los Angeles**

Hales Testing Laboratories
4514 Hollis St., **Oakland**
Hales Testing Laboratories
1475 Blair Ave., **Sacramento**
Abbot A. Hanks, Inc.
624 Sacramento St., **San Francisco**
Hales Testing Laboratories
1509 Terminal Ave., **San Jose**

COLORADO

Oklahoma Testing Laboratories
3111 N. Corn, **Colorado Springs**
Tulsa Testing Laboratory
2512 17th St., P.O. Box 1226, **Denver**
United States Testing Co., Inc.
4639 Lafayette St., **Denver**

DISTRICT OF COLUMBIA

Penniman & Browne, Inc.
Sales Office, Albee Bldg., **Washington**

FLORIDA

Law Engineering Testing Co.
227 E. Union St., **Jacksonville**
South Florida Test Service
4201 N. W. 7th St., **Miami**

Law Engineering Testing Co.
2748 Orange Blossom Trail, **Orlando, Florida**

A. W. Williams Inspection Co.
718 South J St., **Pensacola, Florida**

Law Engineering Testing Co.
P.O. Box 10073, **Tampa, Florida**

GEORGIA

Law Engineering Testing Co.
P.O. Box 432, **Albany**

Law Engineering Testing Co.
136 Forrest Ave., N.W., **Atlanta**

Walker Laboratories
1714 Broad St., **Augusta**

ILLINOIS

Commercial Testing & Engineering Co.
228 N. LaSalle St., **Chicago**

INDIANA

Commercial Testing & Engineering Co.
1240 Hulman St., **Terre Haute**

IOWA

Patzig Testing Laboratories
2215 Ingersoll Ave., **Des Moines**

KANSAS

Tulsa Testing Laboratory
1636 E. Central, Box 2191, **Wichita**

LOUISIANA

Shilstone Testing Laboratory
1068 Neosho St., **Baton Rouge**
Shilstone Testing Laboratory
1026 8th St., **Lafayette**
Shilstone Testing Laboratory
814 Conti St., **New Orleans**
Barrow-Agee Laboratories, Inc.
End of Bell St., **Shreveport**

MARYLAND

Penniman & Browne, Inc.
341 St. Paul Place, **Baltimore**

MASSACHUSETTS

United States Testing Laboratory, Inc.
288 A St., **Boston**

MICHIGAN

The Detroit Testing Laboratory, Inc.
554 Bagley Ave., **Detroit**

MINNESOTA

Lakehead Testing Laboratory
128 S. 46th Ave., West, **Duluth**

Twin City Testing and Engineering Laboratory, Inc.
2440 Franklin Ave., **St. Paul**

MISSISSIPPI

Barrow-Agee Laboratories, Inc.

Greenville

Barrow-Agee Laboratories, Inc.

Greenwood

A. W. Williams Inspection Co., Inc.
Hattiesburg

Barrow-Agee Laboratories, Inc.
Jackson

MISSOURI

Associated Laboratories

2920 Oak St., Kansas City

St. Louis Testing Laboratories

2317 Chouteau Ave., St. Louis

A. W. Williams Inspection Co.
Sales Office, **St. Louis**

NEBRASKA

Harris Laboratories

816 P St., Lincoln

NEW JERSEY

United States Testing Co., Inc.
1415 Park Ave., **Hoboken**

NEW MEXICO

Albuquerque Testing Laboratory
532 Jefferson St., N.E., **Albuquerque**

NEW YORK

Herron Testing Laboratories, Inc.
Buffalo

United States Testing Co., Inc.
625 8th Ave., **New York**

A. W. Williams Inspection Co.
Sales Office, **New York**

NORTH CAROLINA

Law Engineering Testing Co.
1216 E. Seventh St., **Charlotte**

Law Engineering Testing Co.
16 Princess St., **Wilmington**

NORTH DAKOTA

Twin City Testing and Engineering Lab., Inc.
Bismarck

Twin City Testing and Engineering Lab., Inc.
Grand Forks

OHIO

Herron Testing Laboratories, Inc.
1360 W. Third St., **Cleveland**

Columbus Testing Laboratories
755 N. High St., **Columbus, Ohio**
Bowser-Morner Testing Laboratories
135-143 Bruen St., **Dayton, Ohio**

OKLAHOMA

Tulsa Testing Laboratory
P.O. Box 184, **Clinton**
Tulsa Testing Laboratory
2711 Ft. Sil Blvd., P.O. Box 1352, **Lawton**
Oklahoma Testing Laboratories
Muskogee
Oklahoma Testing Laboratories
310 N. Klein, P.O. Drawer 3838, **Oklahoma City**
Oklahoma Testing Laboratories
Tulsa
Tulsa Testing Laboratory
609 S. Peoria, P.O. Drawer 1498, **Tulsa**
United States Testing Co.
Tulsa

OREGON

Charlton Laboratories, Inc.
2340 S. W. Jefferson St., **Portland**
A. W. Williams Inspection Co., Inc.
Sales Office, **Portland**

PENNSYLVANIA

W. B. Coleman & Co.
9th & Rising Sun Ave., **Philadelphia**
United States Testing Co.
3925 M St., **Philadelphia**
Wayne Laboratories
17 East Main St., **Waynesboro**

RHODE ISLAND

United States Testing Co., Inc.
211 West Exchange St., **Providence**

SOUTH CAROLINA

Walker Laboratories
2024 Blanding St., **Columbia**

TENNESSEE

Barrow-Agee Laboratories, Inc.
404 W. Seventh, **Chattanooga**
Law Engineering Testing Co.
600 E. Tenth St., **Chattanooga**
Southern Testing Laboratories, Inc.
3702 Brainerd Rd., **Chattanooga**
Barrow-Agee Laboratories, Inc.
123 S. Front St., **Memphis**
United States Testing Co., Inc.
214-215 Cotton Exchange Bldg., **Memphis**
Barrow-Agee Laboratories, Inc.
64 Bridge Ave., **Nashville**

TEXAS

Trinity Testing Laboratories, Inc.
694 East North 16th St., **Abilene**
Trinity Testing Laboratories, Inc.
300 Allen St., **Austin**
Southwestern Laboratories
2860 Prairie, P.O. Box 4125, **Beaumont**
United States Testing Co., Inc.
Brownsville
Shilstone Testing Laboratory
P.O. Box 4032, **Corpus Christi**
Trinity Testing Laboratories, Inc.
3120 Morgan St., **Corpus Christi**
The Pope Testing Laboratories
Box 903, **Dallas**
Southwestern Laboratories
1212 Oak Lawn, P.O. Box 1618, **Dallas**
Texas Testing Laboratories, Inc.
1416 Young St., **Dallas**
United States Testing Co., Inc.
1700 Cotton Exchange Bldg., **Dallas**
Texas Testing Laboratories, Inc.
1300 West Main St., **El Paso**
Southwestern Laboratories
2900 Cullen, P.O. Box 1379, **Fort Worth**
Trinity Testing Laboratories, Inc.
Highway 77, **Harlingen**
Shilstone Testing Laboratory
2301 W. Dallas Ave., **Houston**
Southwestern Laboratories
1103 Chartres, P.O. Box 175, **Houston**
Texas Testing Laboratories, Inc.
406 Ave. M, **Lubbock**
Southwestern Laboratories
Midland
United States Testing Co., Inc.
San Angelo
Texas Testing Laboratories, Inc.
7th St. at Broadway, **San Antonio**
Trinity Testing Laboratories, Inc.
625 Live Oak St., P.O. Box 2376, **San Antonio**
Trinity Testing Laboratories, Inc.
Victoria

WASHINGTON

Laucks Testing Laboratories, Inc.
1008 Western Ave., **Seattle**
Northwest Laboratories
2nd and James, **Seattle**

WEST VIRGINIA

Commercial Testing & Engineering Co.
626 Broad St., P.O. Box 808, **Charleston**

END

Classification of Causes of BUSINESS FAILURES IN U. S., Year 1957

Based on Opinions of Informed Creditors and Information in Dun & Bradstreet's Credit Reports

LINE OF BUSINESS	All		METHOD OF OPERATION	Construction			
	NUMBER	PER CENT		APPARENT CAUSES		NUMBER	PER CENT
52	2.5	NEGLIGENCE	Due to	Bad Habits Poor Health Marital Difficulties Other	13 28 6 5	0.6 1.3 0.3 0.3	
20	0.9	FRAUD:	On the part of the principals, reflected by		Misleading Name False Financial Statement Premeditated Overbuy Irregular Disposal of Assets Other	3 - 13 4	0.1 - 0.6 0.2
199	9.5	LACK OF EXPERIENCE IN THE LINE	Evidenced by inability to avoid conditions which resulted in:		Inadequate Sales Heavy Operating Expenses Receivables Difficulties Inventory Difficulties Excessive Fixed Assets Poor Location Competitive Weakness Other	736 282 369 54 92 11 602 173	35.0 13.4 17.5 2.6 4.4 0.5 28.6 8.2
454	21.6	LACK OF MANAGERIAL EXPERIENCE	Some of these occurrences could have been provided against through insurance.		Fire Flood Burglary Employees' Fraud Strike Other	- - - 2 3 6	- - - 0.1 0.1 0.3
510	24.2	UNBALANCED EXPERIENCE*					
818	38.9	INCOMPETENCE					
41	1.9	REASON UNKNOWN					
11	0.5	DISASTER:					
2,105	100.0	TOTAL					

Because some failures are attributed to a combination of apparent causes, the totals of these columns exceed the totals of the corresponding columns on the left.

*Experience not well rounded in sales, finance, purchasing, and production on the part of an individual in case of a proprietorship, or of two or more partners or officers constituting a management unit.

A Look at Failures Among Concrete Contractors

**They were up a little in 1957 but the reasons
seem far more significant than the numbers.
See the full-page compilation at the left.**

BY JAMES J. ETRO
Dun & Bradstreet, Inc.

FIFTY-NINE CONCRETE CONTRACTORS failed during 1957 with losses to creditors of \$1,858,000, according to a recent study of Dun & Bradstreet. This represented an increase of 26 percent in numbers compared to the 47 failures reported in 1956 and an increase of 5 percent in creditors' losses compared to 1956's reported \$1,767,000. The 59 failures reported in 1957 represented the highest annual number of failures since failure statistics were first prepared on this line in 1941 and creditors' losses of \$1,858,000 in 1957 also represented an all-time record high. However, the average liability for each concrete contractor that failed in 1957 was \$31,492—a decrease of 16 percent compared to 1956's average liability per failure of \$37,596.

It should be pointed out at this time that these failure statistics include only concrete contractors who failed with losses to creditors. Not included in the tabulations are voluntary retirements from business, transfers of ownership, and those concrete contractors who closed their doors owing no bills. Therefore, the 59 concrete contractors that failed in 1957 are not necessarily the only ones who ceased operations—but they were the ones who did so at the expense of someone else.

Why does a business fail? Is it due to insufficient capital? Is it due to inadequate sales or heavy inventory or the rising costs of doing business? Basically, these are operating problems which every business and businessman experience. They are not the causes of a business failure, but the factors

which influence the success or failures of a business operation.

What then is the cause of a business failure? One pattern has recurred consistently over the years in Dun & Bradstreet's studies into the causes of bankruptcies involving losses to creditors. A failure can be traced in most instances directly to a clearly identifiable human weakness on the part of the people running the business. This human failure may be in judgment, personality, decision or know-how.

In order to help all businessmen avoid the pitfalls which lead to failure, a serious attempt is made to get at the cause behind every failure. The owner, partner, or corporate officer of the bankrupt business is consulted, and a check is also made with banks, suppliers or other outside sources to help form an objective opinion as to why the failure occurred.

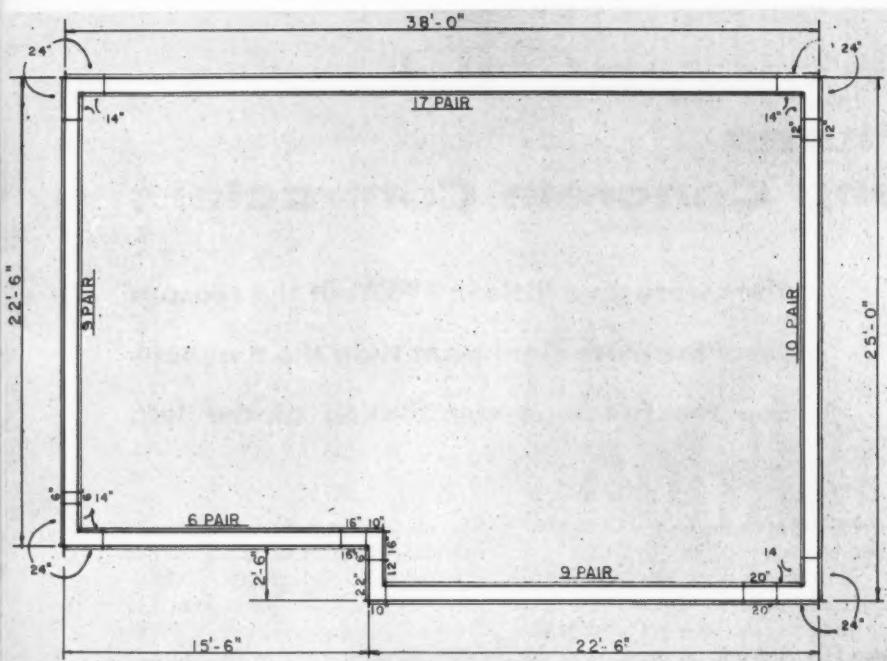
There are, of course, certain hazards and limitations in summarizing all the complex factors which cause a business to fail. However, when you add up the results of these investigations, a definite pattern of the causes of failures emerges. This pattern is well worth studying.

The number of concrete contractors that failed in 1957 is too small in itself to break down elaborately, but a study of the causes of failures among all construction companies indicates danger signals that concrete contractors may use to check their operations. Of the 2,105 construction failures, including concrete contractors, for the year 1957, only 124 or 5.8 percent could be explained by such obvious circumstances as neglect, fraud or disaster. Of the remaining 1,981 or 94.2 percent, the evident causes all fell into

the clear-cut category of management failures. Incompetence accounted for 818 failures (38.9 percent); unbalanced experience was the cause of 510 failures (24.2 percent); lack of managerial experience was at fault in 454 failures (21.6 percent); and lack of experience in the line was the underlying cause for 199 failures (9.5 percent).

The group was further analyzed by the surface causes, or the reasons given as excuses, for the failure. More than one-third (35.0 percent) or 736 of the group who failed said it was because their sales were inadequate (poor sales management). Another 17.5 percent or 369 said it was because they couldn't collect the money owed them (poor credit management); 28.6 percent or 602 blamed tough competition (poor general management) and 13.4 percent or 282 said it was just the heavy cost of operating (poor financial management). Another 4.4 percent or 92 said their hands were tied by excessive fixed assets (poor general management) and 2.6 percent or 54 said it was the inventory burden (again poor general management) that forced them out of business. A few, 0.5 percent or 11, said their trouble was poor location (poor general management). Because some failures are attributed to a combination of apparent causes, these figures add up to somewhat more than the 94.2 percent of the failures analyzed.

Of course, human failure is difficult to pin down statistically. Yet this is a pattern that has turned up year after year in Dun & Bradstreet's failure studies. It indicates that it is a businessman's own ability which counts most in a successful operation. END



Drawing of typical home basement foundation shows panel and filler layout using factory-built forming equipment. Norbert A. Paul, Billings, Montana home builder, poured 37 such basements in 1957 and netted nearly \$5,000 in extra profits.

Prefab Forms Work for Small Contractors, Too

EVEN A RELATIVELY small home builder can realize big profits by setting and pouring his own basements with factory-built forms, judging from the experience of a small-scale builder in Billings, Montana. Contractor Norbert A. Paul purchased a standard set of 8-foot forms in 1956 at a cost of approximately \$3,800.

The prefabricated forms, constructed of $1\frac{1}{8}$ -inch plastic-finished plywood with steel backing bars, were light in weight (65 pounds for a 2- by 8-foot panel), easy to handle, and fast setting. After the first few pours the crew became adept at setting and stripping the forms, and time and labor costs were soon sharply reduced.

Starting January 1, 1957, the Montana contractor began keeping careful cost records on each basement job. Using just one set of forms, he poured a total of 37 home basements during the year. The records indicate that in just 30 pours the entire initial investment in prefab forms was recovered in

total, surely a remarkable indication of the sound economics of this outlay.

The accompanying table shows the cost summary. Included is a liberal allowance for depreciation on the factory-built forms. The figures are complete except for the cost of concrete.

END

Readers who would like to have additional information on the subject discussed in the foregoing article may request it by filling out one of the reader service cards in this issue.

Cost Summary

Average size of 37 basements—150-foot perimeter

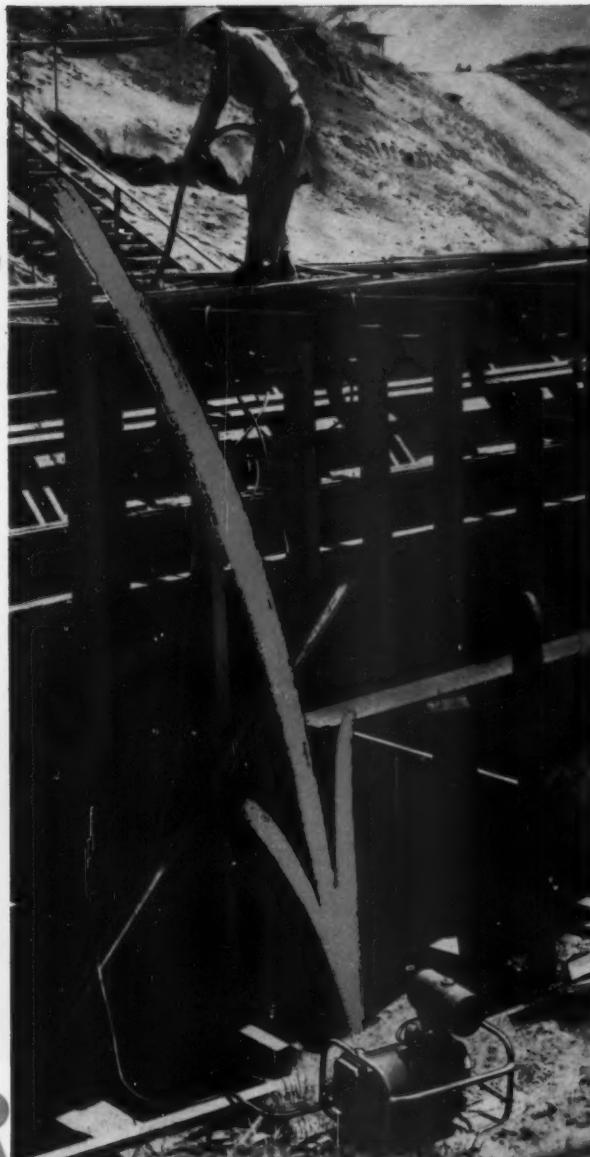
Average selling price per basement \$ 295.36

Average cost per basement*

Tie wires	\$25.44
Oil for forms	1.56
Transportation	3.00
Labor (36 hours)	96.00
Depreciation (over 100 pours)	38.00
Maintenance	5.00
	169.00
Net profit per basement	126.36
Total profit on 37 basements	\$4,675.32

*Does not include cost of concrete

only the
vibrator goes up
on the form



SUPER POWER ELECTRIC VIBRATORS

KNOCK DOWN CONCRETE...FAST!

- **HICYCLE MOTOR** has more kick than any other type vibrator. Really speeds up placement of coarse dry mixes of 3" aggregate and 1" or more slump.
- **MOTOR-IN-HEAD DESIGN.** Only the vibrator goes up on the form. Electric cable connects vibrator to gas engine driven generator located up to 200 feet away.
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Your construction dollars live longer . . . when you use the form facing with the longest life span. Simpson High-Density Overlaid Plywood's protective armor resists aggregate abrasion . . . you get marble-smooth concrete surfaces, pour after pour . . . practically eliminate finishing problems. Easy-to-handle 4' x 8' sheets save on form construction costs . . . up to 5' x 10' unscarfed panels available, too. They assemble faster with a minimum of cutting and waste . . . strip cleaner . . . have a higher salvage factor. Rely on Simpson Forest Quality Products to boost your building profits.

◀ *Better results . . . Faster operation . . . Less cost.*



Learn how to save 30% on forms and finishing costs, write:

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FIELD PROVEN ECONOMY

in all phases of Concrete Placement!

PROTEX Dispersing Agent . . .

PDA increases strength at any age through water reduction and cement dispersion, improving all the desirable characteristics of concrete, giving a "live" concrete with protection against "hot weather" slump loss and segregation—allows the placing of controlled durable air entrained concrete without plastic shrinkage cracks. PDA is a selective initial retarder—retarding only the initial set of concrete for extended vibration and finishing time (not delaying form stripping time) YET it gives no retardation in winter concreting—thus year around benefits are obtained with "all season" PDA.

PDA . . . packaged in a durable bag . . . comes to you in convenient powder form . . . easily mixed and dispensed . . . complete dispensing installations available upon request.

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Proven in the field . . . PDA insures the successful and economical placement of better quality concrete!

Dependable — YES! Proven positive from Government and private projects. Also backed by the world-known and world-respected PROTEX name! Adaptable to any need . . . PDA improves any Pre-stressed, Slip-form, Light-weight, Tunnel-lining, Tilt-up or Lift-slab concrete project! PDA's basic material is purified and desugared having been field tested and proven over past years giving you all the well known benefits—greatest water reduction — cement dispersion — maximum workability and durability — plus PROTEX economy and reliability.

FOR BETTER AND MORE ECONOMICAL PLACEMENT OF CONCRETE, SPECIFY AND USE PDA . . . FROM THE MAKERS OF PROTEX!

Please send new, informative FREE booklet "PDA - Protex Dispersing Agent".

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Attention of . . .

Address . . .

City . . . State . . .

* T.M. Reg.



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Vibrators

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Company _____

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books

CRSI Design Handbook. Prepared by The Committee on Engineering Practice, Concrete Reinforcing Steel Institute. Published by Concrete Reinforcing Steel Institute, 38 South Dearborn Street, Chicago 3, Illinois. 450 pp. \$6.00.

This handbook is newly revised to conform to the recently amended A. C. I. Building Code. It eliminates algebraic formulas and calculations in reinforced concrete designing. The table covering the member to be designed is located, span and load requirements applied and concrete dimensions and reinforcing steel data simply read directly from the table.

Prestressed Concrete Pavement Research Bulletin 179. Presented at the Highway Research Board 36th Annual Meeting, January 7-11, 1957. Published by the Highway Research Board of the National Academy of Sciences, National Research Council, 2101 Constitution, Washington, D. C. 50 pp. Illus. \$1.20.

Three reports are published in this pamphlet. The first, by Phillip Melville, deals with current design practices in Britain and France. Two-directional prestressing is most often used in those countries, with the amount gradually lowered in recent projects to near 200 psi. Comparison is drawn between the European methods and those used in the United States. The second report, by Thomas Cholnoky, describes the design and testing of experimental prestressed concrete slabs at the Patuxent River Naval Air Station. Paul F. Carlton and Ruth M. Behrman, in the third report, describe studies carried on as part of the Rigid Pavement Investigational Program conducted by the Ohio River Division Laboratories.

Concrete for Radiation Shielding. Published by American Concrete Institute, P. O. Box 4754, Redford Station, Detroit 19, Michigan. 132 pp. \$4.00.

Seven papers on the use of concrete for shielding nuclear radiation and the calculation of proportions and properties of various heavy concretes are presented in this publication.

"Concrete for Radiation Shielding" emphasizes factors related to concrete

Prestress Producers Asked For It...

and Here It Is!

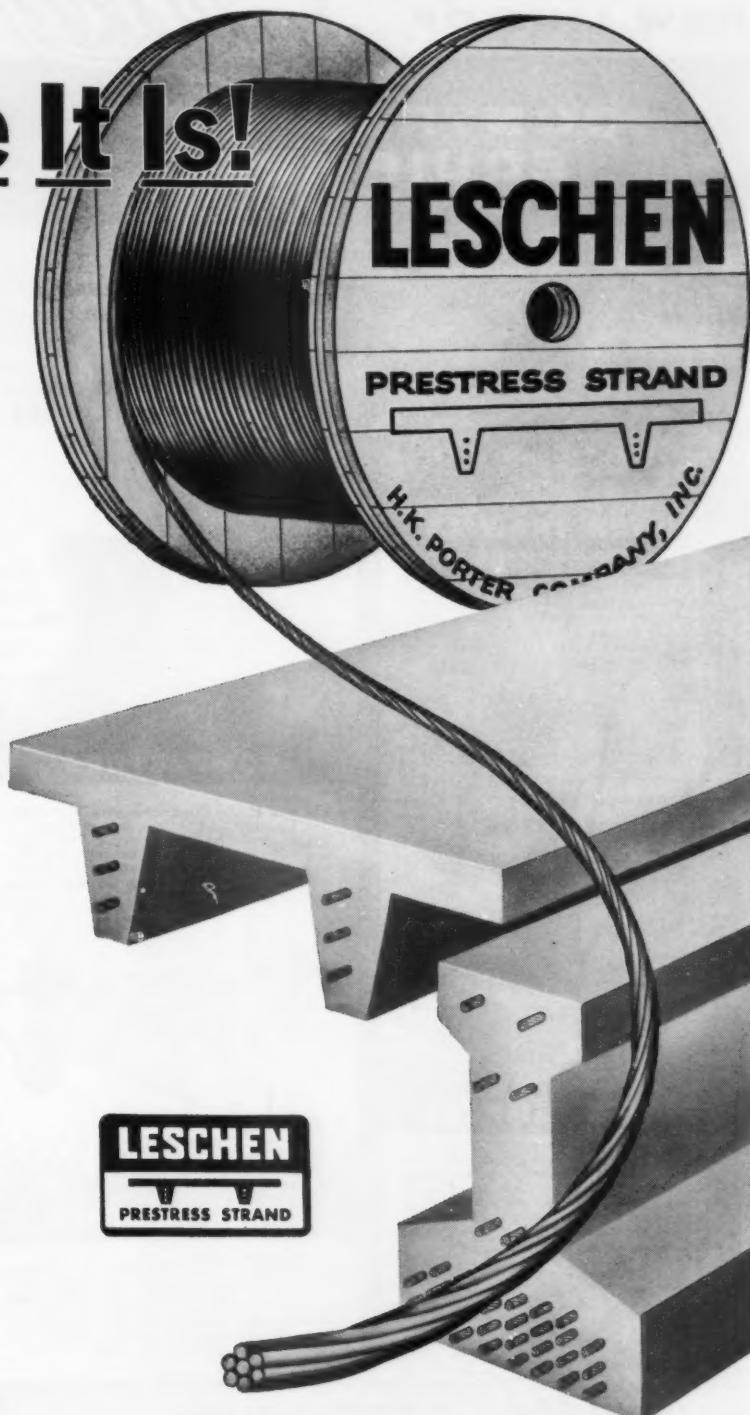
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Strictest quality controls insure your complete satisfaction on every count...breaking strength, uniform elongation, ease of handling and other physical properties.

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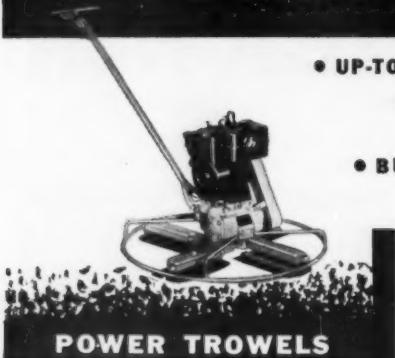
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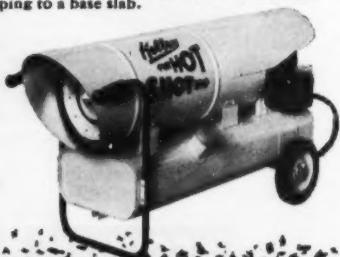
POWER TAMPERS

Self-propelled... delivering 2400 impacts a minute. Two models: 18" wide shoe, and 36" wide shoe. For packing down earth backfill to maximum density next to foundations, on road-widening jobs, around culverts and in pipeline trenches. Also for finishing black-top driveways.



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The new Kelley Compactor with "Compaction Control". An entirely new machine... larger, easier operating, faster and more powerful. For compaction-floating concrete floors, for keying in tough surface hardener materials, and for bonding dry-tamp topping to a base slab.



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technology and cost. Tables and curves of concrete thickness required for shielding are given for both ordinary and heavy concrete. Problems involved in the use of special concrete are discussed and an outline of a procedure for designing concrete shielding is presented. "Absorption by Concrete of X-Rays and Gamma Rays" reviews the experimental work performed by the National Bureau of Standards to establish data with which concrete barriers may be designed and discusses the relative merit of several barrier materials. "Properties of High-Density Concrete Made with Iron Aggregate" presents data on the physical properties of several types of mortar and concrete made with iron-bearing aggregate. "Heavy Steel-Aggregate Concrete" is a discussion of various mix proportions for heavy concrete and a proportioning procedure for concrete of given strength and density. "Properties of Heavy Concrete Made with Barite Aggregates" reports the results of tests performed on barite (barium sulfate) to determine its physical properties and its potential value as an aggregate in conventional and prepacked concrete where high density is desired. "Magnetite Iron Ore Concrete for Nuclear Shielding" compares the physical properties and costs of magnetite ore concrete to those of other concretes. "Proportioning of Mixes for Steel Coarse Aggregate and Limonite and Magnetite Matrix Heavy Concretes" offers data on heavy structural concrete, utilizing limonite and magnetite ores as fine aggregates and graded steel scrap as coarse aggregate.

Register of Dams in the United States. Sponsored by the United States Committee of the International Commission on Large Dams; prepared by T. W. Mermel, Chairman, Committee on the Register of Dams. Published by McGraw-Hill, 327 West 41st Street, New York 36, New York. 444 pp. Illus. \$12.50.

This reference manual provides essential statistics on over 2,800 important dams in the United States. Name, location, structural data, ownership and names of engineering and contracting firms are given for each dam. Dams are listed alphabetically by name, with a cross reference of reservoir names which often differ from the names of the dams. Pictures of over 300 dams are included.

SYMONS FORMS can help your firm

save on labor and material costs . . . save time . . . do a better job

Symons different type forms are not confined to a single type of application. They can be used on most any type construction job and on any height wall. Factory-made from the finest of materials. Frames of the Steel-Ply and Mag-Ply Forms have an indefinite life.

Wood-Ply

Symons manufactures three types of wood forms. *High Strength Panels* . . . recommended for pouring concrete walls with pressures up to 1,200 pounds per square foot; "Champ" Panels . . . for both commercial and residential work; *Light Construction Panels* . . . for light or residential construction, where heavy pressure is not a factor.



Symons High Strength Panel has steel cross members on 12" centers. Its weight averages just 5 pounds per square foot.

Wide Panel

Symons Wide Panel Forms have steel struts and 2x4 cross members to strengthen the panel and minimize deflection when subjected to heavy pressure. These forms are used in gang forming. They have tie holes in the steel struts which allow the insertion and removal of special ties when the panels are ganged. Built in 6' and 8' lengths and 30", 36", 42" and 48" widths.



Pouring a 2,400 foot retaining wall with Symons Wide Panel Forms made up in gang sections of 10'x24' and 15'x24'.

Steel-Ply

Designed for durability and long-life. The initial cost of these forms is higher than Symons Wood-Ply Forms. However, this first cost is more than offset by the many reuses possible with these panels. They are easily erected and stripped with the 3 basic pieces of the Symons System—connecting bolt, panel tie and wedge.

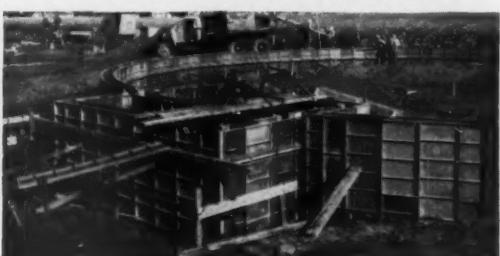
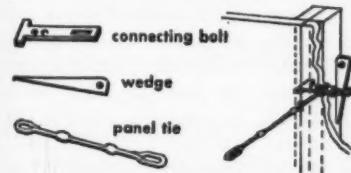


37,000 square feet of Steel-Ply Forms used on the Air Force Academy, Colorado Springs, Colorado.

Mag-Ply

Symons Mag-Ply Forms are the lightest forms available . . . weight averages about 3½ pounds per square foot. The frames of durable, rust-proof magnesium completely encase the plywood, will last indefinitely and will not swell or shrink. 2½" thickness of frames means more panels per truck load, less space for stacking and storage.

Only 3 Hardware Pieces



Light and efficient Mag-Ply Forms are readily adaptable for circular, battered and cut-up walls.



Symons CLAMP & MFG. CO.

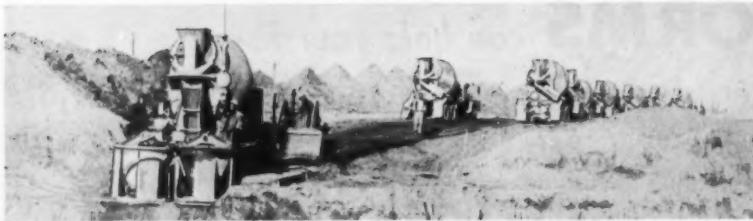
4271 Diversey Avenue • Dept. J-8 • Chicago 39, Illinois

Warehouses in California, Kansas, Minnesota and New Jersey • Sales Offices and agents in principal cities

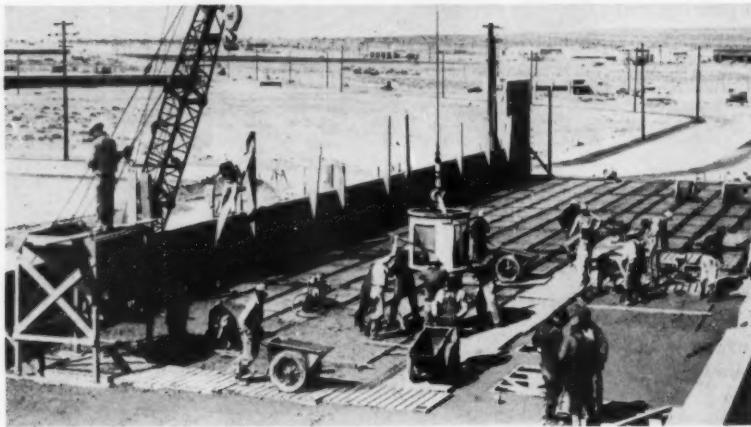
more SAVINGS from SYMONS

Circle #624 on mailing card

Symons Forms available on a Rental Basis.
Rentals can apply to purchase price.



Concrete job pays extra profits for careful planning of concrete handling



Concrete construction on this 300' x 600' airplane hangar required two types of concrete handling—(1) bulk handling for columns, foundation and 17" thick walls and (2) slower paced handling for thin finished floor slabs. The problem was—how to prevent delays and inefficiencies in one or both placement jobs.

The answer here was to divide the work and use two separate crews and two concrete handling methods simultaneously.

First, two Gar-Bro Buckets per crane were used for the bulk placing. While one bucket was being filled, the other was placing concrete. Thus with a minimum crew, a fast pace was maintained.

Second, Gar-Bro Floor Hoppers and a fleet of Concrete Carts supplied the slab work. The concrete buckets load the floor hoppers for cart charging and alternate for direct column pouring, thus holding the balance of the operation.

In this way there were no delays and no interruptions of work. A steady delivery of concrete by ready mix trucks provided maximum efficiency.

Since every wasted minute costs money on a concrete job and delays cost more than equipment, it pays to plan each job properly. Many similar innovations are described in the regular issues of Gar-Bro Concrete News and the Gar-Bro Concrete Manual, available on request.

GAR-BRO MANUFACTURING CO.
Los Angeles, California • Peoria, Illinois
General Offices:
2415 East Washington Blvd.
Los Angeles 21, California

GAR-BRO
The world's most complete line of
CONCRETE HANDLING
EQUIPMENT

Circle #608 on mailing card



equipment and tools

For additional free information
mail cards facing page 18.

Dispersing Agent

A new plastic dispersant for concrete may be used for bonding new concrete to old, or as a replacement for water in mixing concrete for patching and resurfacing. The plastic, new in its use in concrete according to the manufacturer, is combined with dispersing and wetting agents in a ready-to-use solution. Excellent shear strength when used as a bond is reported. When used to replace water in mixing concrete unusual wear resistance, load bearing strength, and resistance to sag are reported. The concrete so mixed is water, oil and solvent proof and unaffected by temperature changes. Easy placing and finishing are also features of this concrete. It is recommended for all types of floors and for restoration or waterproofing of all masonry surfaces. Write **Acorn Paint & Chemical Company, 8001 Franklin Boulevard, Cleveland 2, Ohio.**

Splice for Tensioning Strand

Odd lengths of tensioning strand which are often wasted may be spliced with Preformed splices. The manufacturer claims that they provide a splice that is stronger than the strand itself. The splices may also be used in the case of broken wires in the strand. These splices hold the full-rated strength of the strand and are available in the same material. Write **Preformed Line Products Company, 5349 St. Clair Avenue, Cleveland 3, Ohio.**

Concrete Sealer

Supersan Concrete Sealer, like all concrete sealers, is designed to prevent the dusting and powdering of concrete floors and walls. The manufacturer claims that his formula, based on a Chinawood oil material is scientifically formulated to provide a superior product at a competitive price. Write **Chemical Compounding Corporation, Brooklyn, New York.**



You're wrong, Mark Twain, with your "Everybody talks about the weather, but..."

Concrete producers DO something about low temperatures when they treat with COLUMBIA CALCIUM CHLORIDE

THEY MAKE CONCRETE PRODUCTS SET FASTER

And make more profit on them. Mark that, Mark Twain. That's because they get days-shorter curing on pre-cast units, blocks, pipe. Columbia Calcium Chloride *actually* works most noticeably when temperatures *drop*. Pre-steam holding time, steaming and soaking periods can all be safely reduced. There's less cracking during early handling, and ultimate strengths test higher, too. Producers save on inventory costs, yet make earlier deliveries. Are you specifying Columbia Calcium Chloride in your various mixes?



THEY MAKE READY MIX THAT SETS FASTER

No need to mention what this means to contractor-customer job costs. Strength specs can be met days sooner, forms pulled for other jobs, finishers moved in and off without profit-killing overtime. Columbia Calcium Chloride gives both initial and final set a full *three times faster!* Contractors sleep a lot better these cool fall nights . . . wake up to give the next order to the supplier who adds protective, job-bettering Columbia Calcium Chloride to ready mix. Have *you* been getting their business? Columbia Calcium Chloride could clinch your sale.



WRITE TODAY FOR COMPLETE INFORMATION . . . PLEASE MENTION WHETHER INTERESTED IN CONCRETE PRODUCTS OR READY MIX

COLUMBIA-SOUTHERN CHEMICAL CORPORATION

A Subsidiary of Pittsburgh Plate Glass Company

DISTRICT OFFICES: Cincinnati, Charlotte, Chicago, Cleveland, Boston, New York, St. Louis, Minneapolis, New Orleans, Dallas, Houston, Pittsburgh, Philadelphia, San Francisco IN CANADA: Standard Chemical Limited

Circle #603 on mailing card

equipment tools materials

Additional free information concerning any item described in these columns may be obtained by filling

out and mailing the postage-free reader service cards located between pages 18 and 19 in this issue.

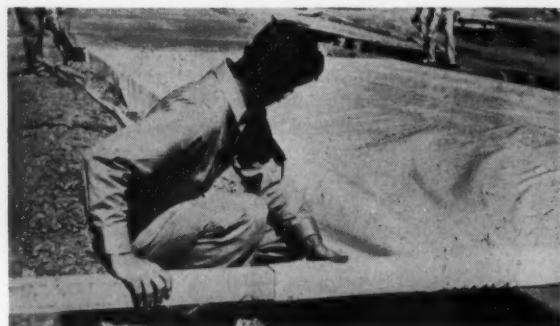


Curing With Polyethylene

White polyethylene film is here shown being used as a curing blanket on the Texas Turnpike. The white film is preferred over natural because it reflects sunlight and thus allows less heat absorption. Enough film to cover 1,000 square feet of highway weighs less than 20 pounds. The material is said to drape easily over the edges of the pavement and to fit snugly around cutouts for drains. **Bakelite Company, Division of Union Carbide Corporation, 260 Madison Avenue, New York 16, New York.**

Portable Conveyor

The conveyor pictured here is interchangeable from chain-and-flight to belt. The solid trough of the chain-and-flight rigging also supports the belt the entire length of its ascent. No pockets can form causing separation of concrete materials. When the belt kit is used, head and tail pulleys are connected with a roller chain. The top pulley carries most of the load because the weight of load increases traction on the top pulley. This top drive increases efficiency and prolongs belt life. **Morgen Manufacturing Company, Yankton, South Dakota.**



What Happens When You Can't Cross Property Lines to Form a Wall?

With only one-inch clearance to work in, here's how a problem was solved with Gates.

Problem: In forming the 14-foot-high foundation walls of this job, the contractor was not allowed to trespass on the adjoining property in any way, so all forming had to be done from the inside. Clearance between the foundation wall and the property line was one inch. In addition, exterior below-grade damp-proofing was specified by the architect.

Solution: Working with the local Gates representative, the contractor selected Gates Vertical Rod System for the job. Asphalt-coated corrugated metal sheets were used for the outside form panels and allowed to float. Conventional Gates methods were used for the inside of the wall. With the architect's approval, the coated metal sheets and 14-foot steel rods were left in place after the concrete was poured.

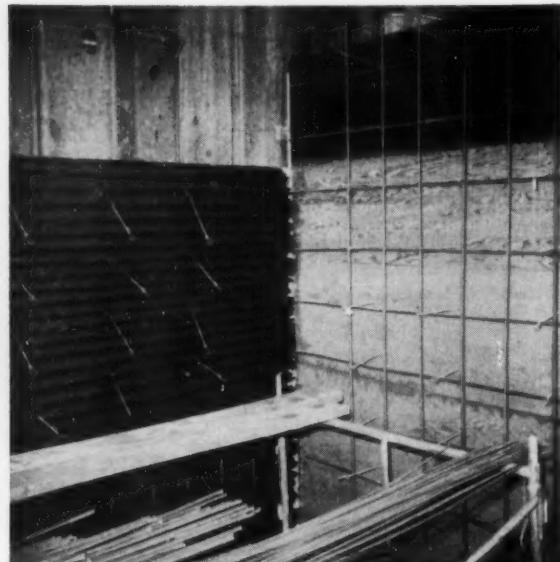
Results: The unique forming method cost no more than conventional Gates forming. Excellent results were obtained. This proven versatility of Gates Forming Systems can help you, too. Why not investigate?



Gates & Sons, Inc.

80 So. Galapago St. Denver 23, Colorado
Branches in Spokane, Wash., Rochester, N. Y. and Lethbridge, Alta.

SEE OUR CATALOG
IN SAFETY & ARCHITECTURAL
FIRE
BY WHITE FIRE CO.



Concrete forms—foundation wall of Harris Building, Oklahoma City, Oklahoma. Note corrugated metal sheets used for outside form panels.

Contractor: Commander Construction Co., Oklahoma City
Gates representative: Vernon L. Mock Co.

Circle #609 on mailing card

Do better work faster, with more profit...use rugged

THOR CONSTRUCTION EQUIPMENT



**THOR MOTOR-IN-HEAD
CONCRETE VIBRATORS**

Universal electric (AC or DC). Plug into any electric current source, including portable generators, for true one-man economy in transporting, setting up and operating. Motor-in-head (no power-wasting flexible shaft) delivers 15,000 V.P.M. Thor CV2 Series Vibrators available in 10- and 20-foot operator "hose" lengths



1500 AND 2500 WATT GENERATORS

Choose from 2 series of lightweight portable power plants. Thor's new 2500 watt DC, engine-driven generator and the time-tested 1500 AC or DC models. Here's husky electric power which can go where you go easily.



29" AND 39" TROWELS

Easiest operating trowel on the market, does a better, safer job with less crew time. Light, portable. Blade-center suspension for better troweling action. Reversible blades positive tilt adjustment.

For increased production on the job site, lower man-hours per job, better results, specify Thor construction equipment, backed by dealer and direct factory branch authorized service throughout the world. Your dealer will show you Thor's superiority right at the job site. Thor Power Tool Co., Aurora, Illinois.



THOR POWER TOOL CO.
Branches in all principal cities



7", 10", 13", 16" VIBRATORY FINISHING SCREEDS

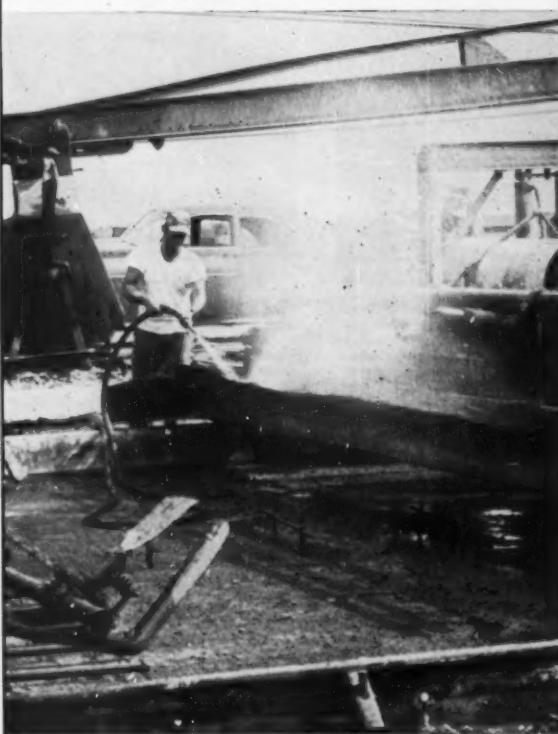
Packed with features—strike-off, compact, finish concrete in one low-cost operation. Lightest screed on market. Two men can handle easily. "StraPaction" vibration. Uses inexpensive forms or pipe rails. Stock lengths of 7", 10", 13" and 16". Intermediate sizes in order.

Circle #628 on mailing card

More EFFECTIVE WASHDOWN

for
TRUCKS • PAVING MACHINERY
MIXERS • EARTH MOVERS

CLEANS RIGHT DOWN TO THE PAINT!



- ELIMINATES CHIPPING AND SCRAPING
- EXPOSES ALL LUBRICATION FITTINGS
- KEEPS EQUIPMENT LOOKING NEW

This compact, portable washdown pump is powered by a four cycle gasoline engine. Can be used anywhere. Self-priming, no check valves. Delivery to 40 gpm—pressures to 150 psi.

WRITE FOR FREE ILLUSTRATED BOOKLET
ON MODEL 6600 WASHDOWN PUMPS.



MARINE PRODUCTS COMPANY
515 LYCASTE DETROIT 14, MICHIGAN

FLOMAX MP STRAIGHT DURAFLEX
SELF PRIMERS CENTRIFUGALS ROTARIES

Circle #613 on mailing card

equipment and tools

For more information mail cards facing page 18.



Rubber Expansion Joint

In the picture an engineer makes final connection of a newly designed rubber expansion joint before it is placed into a highway expansion gap. Anchored between road sections for a water-tight seal, the joint is about 13 inches wide, and extends the width of highway or runway, and fully fills the joint connection to its required depth. Synthetic rubber specially compounded to absorb movement of highways or runways in cold and warm weather eliminates road shock and permits smoother aircraft landings. **The B. F. Goodrich Company, Akron, Ohio.**

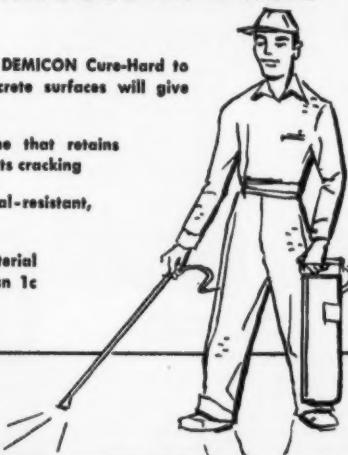
perfectly cured and hardened
CONCRETE
at a cost savings
with DEMICON Cure Hard

One application of DEMICON Cure-Hard to freshly poured concrete surfaces will give you:

a perfect membrane that retains moisture and prevents cracking

a dust-free, chemical-resistant, hardened surface

a cost savings—material applied for less than 1¢ per square foot



McMILLAN FLOOR PRODUCTS CO.

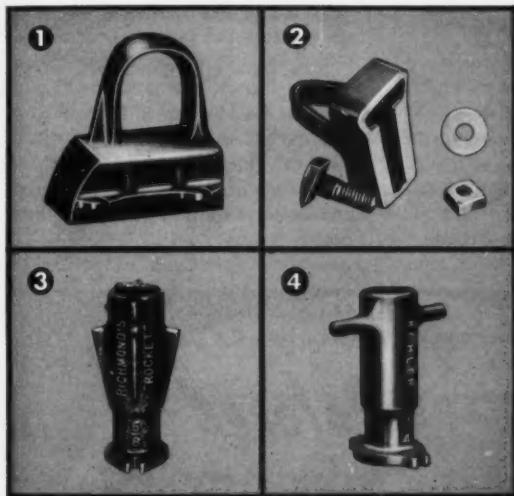
2045 East Eight Mile Road Hazel Park, Michigan

For FREE Information write direct or use Reader Service Cards

Circle #615 on mailing card

Richmond Concrete Inserts speed the job... Safely and Economically

Fastening to concrete made safe and easy by versatility and strength of
Richmond Concrete Inserts



The variety of types and sizes of Richmond's Concrete Inserts gives you the added assurance of always having the right tool for any hanging or anchoring job. These products are laboratory tested and you can rely on their recommended working loads.

1 Richmond Malleable Adjustable Inserts—rugged box castings designed to take the head of a standard machine bolt. The ribbed sides of the box and the ample loop provide bond and anchorage. Adjustment is obtained by moving the bolt in the slotted face of the insert.

2 The Peerless Wedge Shelf Angle Insert—a malleable iron casting whose wedge shaped holding face works in conjunction with a special askew head bolt. Designed to hold shelf angle at an exact elevation for masonry veneer support. Wedge action prevents slippage when nut is tightened. Anchor loop can take a $3/4$ " reinforcing bar to increase anchorage in concrete.

3 The Richmond Rocket Insert — a rugged malleable iron threaded insert especially designed for use where impact or vibration are a factor such as hanging air-conditioning machines, etc. The enlarged fins distribute the load back into the concrete.

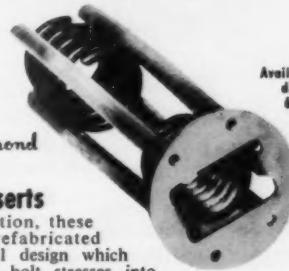
4 Kohler Threaded Inserts by Richmond — the original threaded inserts designed to take a standard machine bolt or threaded rod for supporting hung ceilings, pipes, conduits, etc. Approved by Underwriters Laboratory for hanging sprinkler systems. Body shape and side lugs provide sufficient bond and anchorage.

These inserts are provided with either holes or lugs which makes nailing them to the forms a simple, speedy operation with no need for drilling of decking or sheathing.

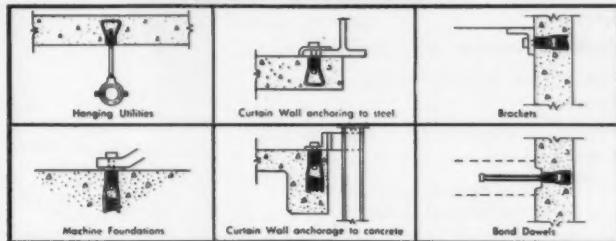
New Richmond Structural Concrete Inserts

A recent addition, these inserts are prefabricated from a special design which distributes the bolt stresses into the concrete for greater strength than any previously known device. Laboratory tests show these inserts to have ultimate strengths far in excess to their actual, recommended working loads. This strength performance permits designers to develop the full working strength of bolted connections with more than adequate safety factors. The new Richmond Bulletin on Structural Concrete Inserts contains certified test data for these inserts.

Available in $1/2$ " to $1\frac{1}{2}$ "
diam. in strengths to
65,000 lbs. in 3,000
psi concrete



TYPICAL APPLICATIONS



Send for your free copies of this bulletin and the current Richmond Handbook which give you complete data on types, sizes, working loads and the varied uses of these inserts... and also show the full line of more than 400 Richmond-engineered Tying Devices, Anchorages and Accessories for the concrete construction industry—write to:

**INSIST ON RICHMOND
AND BE SURE
IT'S RICHMOND**

Richmond
SCREW ANCHOR CO., INC.
816-838 LIBERTY AVE., BROOKLYN 8, N.Y.
315 SOUTH FOURTH ST., ST. JOSEPH, MO.

Circle #617 on mailing card

Proved Cost Saver CURE and SEAL CONCRETE WITH 1 PRODUCT

THOMPSON'S
WATER
SEAL



**Eliminates wet sacks,
papers, hosing and spraying**

Spray deep penetrating, colorless Thompson's Water Seal on fresh concrete to cure and seal in one operation. Save time . . . save labor.

Effectively controls moisture loss for 28 days and beyond.

Assures uniform curing even in hot, dry weather.

Helps reduce checking, cracking, spalling.

**Produces harder, dust-free surface.
Eliminates waterproofing concrete floors.**

Permits adequate time for smooth troweling.

Send for technical bulletin and Contractors Case History file.

A proved bond breaker for pre-cast, tilt up and lift slab construction. Permits easy, clean separation of slabs, walls, pre-cast members.

Available in 5 and 55 gallon drums from building supply stores, paint and hardware dealers.

Thompson's

MANUFACTURERS OF FINE PROTECTIVE
CHEMICALS SINCE 1929

E. A. Thompson Co., Inc., Merchandise Mart,
San Francisco 3, California

San Francisco • Los Angeles • San Diego •
Portland • Chicago • Seattle • Denver • Dallas
Houston • St. Louis • St. Paul • Detroit
Philadelphia • New York City • Memphis •
Cleveland • Factory: King City, California

Circle # 627 on mailing card

30

equipment tools and materials

Additional free information concerning these items may be obtained by mailing the reader service cards located between pages 18 and 19.

Fir Plywood Panels

Fir plywood panels 8 feet wide are available for forming from The Diamond Lumber Company. Furnished either primed and edge-sealed or painted, the panels feature a special scarf-joint, and are available in thicknesses up to one inch and in almost any length. Write The Diamond Lumber Company, Pittock Block, Portland, Oregon.

Masonweld coating for brush application is an epoxy resin waterproofing agent, and is recommended for all concrete surfaces, exterior or interior, where weatherproofing and waterproofing are desired. It is available in gray or white, or in other colors upon special order. Write American Metaseal Corporation, 607 65th Street, West New York, New Jersey.

Concrete Vibrator

Carburized and hardened steel casings are featured on two concrete vibrators, the 2½-inch diameter model with an 8-foot hose and the 3-inch diameter model with a 10-foot hose. Both models have built-in line oilers and shut off automatically in case of insufficient lubrication. Write Gardner-Denver Company, Quincy, Illinois.

Epoxy Resin Products

Masonweld concrete adhesive is an epoxy resin bonding agent which, it is claimed, provides a strong bond between new and old concrete, and eliminates chopping out or roughening old concrete before applying. It is recommended for restoration and repair on any type of concrete structure.

Colored
ready-mixed
Concrete

**10 DIFFERENT
COLORS**

ECONOMICAL—costs very little extra per square foot . . .
DURABLE—color all-the-way through the concrete . . .
PERMANENT—to weather and sunlight . . .

For further information and color card write to

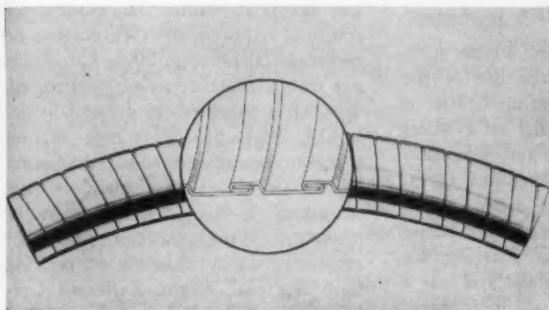
FRANK D. DAVIS CO.
3285 E. 26th STREET LOS ANGELES 23, CALIF.
Eastern office:
P.O. BOX 292 NIXON, NEW JERSEY

Circle # 605 on mailing card

CONCRETE CONSTRUCTION

equipment and tools

For more information mail cards facing page 18.



Post Tension Casing

This post tension casing is fabricated from .012-inch strip steel with a four-wall metal thickness and fully interlocking, spiral tight seam to support the flexible tube against impact loads. The wide profile design gives the flexible casing a smooth non-kinking curve lie in concrete forms. Less internal contact surface reduces initial friction drag in applying tension to reinforcing components. Shipped in specified lengths, it may be spliced in the field. Grouting inlet connections are available. **Universal Metal Hose Company, 2133 South Kedzie Avenue, Chicago 23, Ill.**

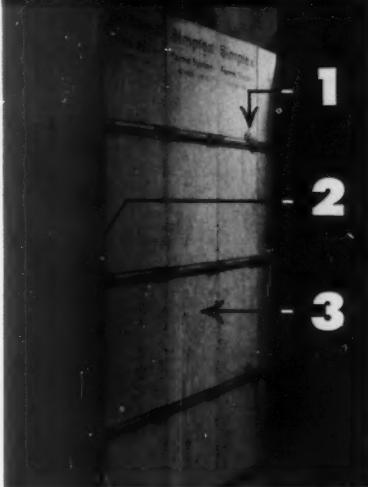


Screeeding Problem

An underslung vibration screed which would span this 28-foot 3 1/2-inch bridge deck in Florida, and yet ride on the rails mounted over the parapet reinforcement 11 inches above the concrete surface, was required by the contractor. Pictured here in the background is the specially designed Stow screed, and a Stow midget vibrator with 1 1/4-inch diameter head which was used for vibrating concrete underneath closely spaced parapet reinforcements. **Stow Manufacturing Company, 354 Shear Street, Binghamton, N.Y.**

Simplex FOOT-A-MINUTE forms

OFFER YOU ADVANTAGES
THAT MEAN MORE PROFIT



FASTER SET-UP and STRIPPING NO LOOSE HARDWARE

PATENTED LOCKING LEVER

1

Made of precision-finished, hardened steel. Bolted permanently to forms. A tap on lever locks or unlocks it. Cam action pulls panels together, minimizing seam marks, and giving positive wall dimension.

2

SIMPLEX TIE WIRES
Specially designed steel tie wires are made to withstand pressures up to 4,000 lbs., yet easily broken off without twisting in wall. Simple to drop in place . . . held securely by locking lever.

3

PLASTIC PANELS
Simplex panels are highest grade 1 1/4" impregnated plastic plywood backed with four 2" x 3/4" metal bars running the full width of each 8' panel. Construction gives greater strength than 2 x 4 backed forms with double walers. Full size 2' x 8' panel weighs only 65 lbs. Four, six and ten foot panels also available.

IT ALL ADDS UP TO A COMPLETE
FOUNDATION IN 24-MAN HOURS
OR LESS WITH REDUCED LABOR COSTS

SEND FOR BULLETINS

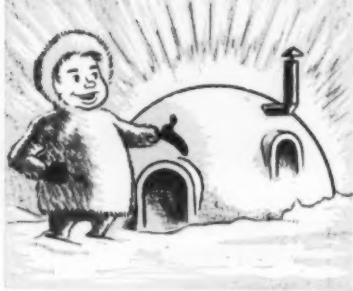
Simplex FOOT-A-MINUTE forms

SIMPLEX FORMS SYSTEM, INC.
5603 INDUSTRIAL AVE., ROCKFORD, ILL.

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WEATHER OR NOT... SIKACRETE GIVES YOU

- **EARLY FLOOR FINISHING**
- **EARLY STRENGTH**



Sikacrete Accelerating Densifier causes early set and quick strength development in both concrete and mortar — thus saving many costly hours of overtime finishing.

Sikacrete is a liquid admixture which enables you to place high quality concrete floors — despite cold weather.

Moreover, Sikacrete gives you these big advantages: greater density, hard non-dusting surfaces, increased ultimate strength and reduced cracking. For complete information, write for Bulletin SI-57.

26-3



Circle #618 on mailing card

32

equipment tools and materials

Additional free information concerning these items may be obtained by mailing the reader service cards located between pages 18 and 19.

Polyethylene Film

A polyethylene sheet which it is claimed will last for the life of the structure without becoming brittle or splitting is recommended as a water barrier, and as moisture and dustproofing over subflooring, under roofing, on the warm side of walls, around foundations, in crawl spaces and under slabs. It also serves as covering for equipment and materials and as a concrete curing material. It is available in 2, 4, and 6-mil weights and in widths up to 40 feet, in 100-foot rolls. Write **Richkraft Company, 510 North Dearborn Street, Chicago 10, Ill.**

can be held within 10 percent of specified requirements. Weight can be controlled at between 20 to 75 pounds per cubic foot, depending on need. Betocel is prepared in a specially-designed, high-speed, low-cost mixing machine, saving construction time and labor costs. It can be mixed by any workman. It has the consistency of heavy malted milk, but can be screeded or leveled off immediately on pouring with one pass. Write **Reflectal Corporation, Subsidiary of Borg-Warner Corporation, 310 South Michigan Avenue, Chicago 4, Ill.**

Testing Service

A new "Mail-Test" service is available from the Haller Testing Laboratories. Samples of highway materials used in bituminous concrete and portland cement concrete pavements are mailed to the nearest branch laboratory in pre-addressed and stamped containers, and reports are phoned or mailed back. The new service will relieve municipalities, consulting engineers, contractors, builders and material suppliers of the need for investment in setting up their own laboratories and annually retaining experienced engineers and chemists for the summer paving period. The cost is nominal, making the service practical for parking lots, shopping centers, gas stations and private airports as well as for public works projects. Write **The Haller Testing Laboratories, Inc., New York, N.Y.**

Mixer

A new 6-cubic foot, one bag-capacity tilting concrete mixer is available in a choice of gasoline or electric drive. It is equipped with hardened roller chain and sprockets for long life. Timken bearings throughout assure trouble free service. The machine is designed for one man towing, spotting and operating, with low charging height and balanced low center of gravity. Write **Western Equipment Division, Douglas Motors Corporation, Milwaukee, Wisc.**

Cellular Insulating Concrete

Betocel, a cellular insulating concrete, is used in fill installations giving many of the features of high cost rigid insulations at the low cost of wet poured fill. The material consists of sand, cement, water and a special bubble-forming emulsion. The end product is a cellular concrete which has important cost advantages in certain building applications the manufacturer claims. Insulation properties

Dodson's Digest



Filmflam

Of the many who agree that "one picture is worth a thousand words," Bill Bush, a concrete contractor, is among the most devout — thanks to his ever-present camera. He's a shutterbug in the fullest sense.

I visited him on the job recently where he was pouring basements for a group of suburban homes. "Hi, Bill. How's the concrete business?" I shouted, as I walked over.

"Solid," he grinned. "Sure happy with the job Calcium Chloride is doing!"

"I'm not surprised," I replied. "Not only can it save you time and money during warm weather, but with winter coming on, it's doubly important. Eliminates freezing, chipping, cracking. Gives higher early and final strength. What's more, it gives you . . ."

"More time for taking pictures, Dod," he broke in. "Won a couple amateur photo contests recently — so it's becoming a profitable sideline!"

"Literally a sidewalk photographer," I laughed. "Really, Bill, it's good to know that both your business and your hobby are going well . . . and I modestly take credit for starting you on Calcium Chloride."

Just then, I felt a drop of rain and automatically looked up, holding my hand out. Before I could blink an eye, Bill yelled, "Hold it, Dod!" and snapped the shutter of his camera.

"I'll give you credit for making my hobby successful, too!" he smiled. "This one's a sure winner."

Puzzled, I asked, "How can a shot of a guy holding his hand out to see if it's raining be of any interest?"

"Well, Dod," he explained, "just as you were doing that, the mixer on the truck was dumping its load right behind you. In the picture, it'll be raining concrete — a real classic!"

— L. D. DODSON

P.S. — If your profit picture is kind of blurred, write me for a copy of our free booklet, "How To Make Better Concrete Products and Ready-Mix." Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.

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HEADQUARTERS FOR CALCIUM CHLORIDE

Circle #631 on mailing card
SEPTEMBER 1958



Literature

For additional free information mail cards facing page 18.

Scaffolding. A 12-page bulletin, PTS-18R, illustrated with application photographs and detailed technical drawings, contains complete descriptions, installations instructions, engineering data and suggested uses for "TubeLox" scaffolding in construction, maintenance and repair work. The Patent Scaffolding Company, Inc., 38-21 12th Street, Long Island City 1, N.Y.

Concrete colors. A new 4-page brochure describes a method for building in life-long color in concrete floors. Applicable to either exterior or interior surfaces, this method has been widely used in patios, swimming pools, driveways, walks and terraces. Producing a more wear-resistant surface than the best plain concrete, at only a few cents more per square foot, it provides an economical means of producing colored floors for stores, showrooms, offices, churches, schools and public buildings. It is particularly advantageous in service stations because its high density surface is oil-resistant and easy to clean. The Master Builders Company, 7016 Euclid Avenue, Cleveland 3, Ohio.

Maintenance finishes. A brochure, bound in loose-leaf form for additions as the firm adds new products to its line, explains the use of epoxy maintenance finishes and provides a chart of colors available in the material. Technical data pertaining to the finishes is included, giving a clear understanding of the physical and chemical merits of the materials for a given application. Vinyl maintenance coatings are also discussed. Hauger-Beegle Associates, Inc., 900 West 49th Place, Chicago 9, Ill.

Form ties and accessories. Catalogue 160 contains pictures and specifications of a complete line of form ties and accessories and other products for the concrete contractor, and is well indexed for quick reference. Engineering and field service and a sound-color film which shows on-the-job concrete forming are offered by the manufacturer. Universal Form Clamp Company, 1238 North Kostner Avenue, Chicago 51, Illinois.



Construction News

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Literature

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Soil testing device. The Washington Dens-o-meter provides positive and accurate readings in making moisture-density and compaction tests of embankment and foundation soils. Tests are completed in about 3 minutes after hole is dug. The apparatus can be used in a wide range of hole sizes and is light in weight and easy to operate and maintain. Operating procedure is explained and illustrated in the brochure. Charles R. Watts and Company, 4121 Sixth Avenue, N. W., Seattle 7, Washington.

Steel door frames. A new 6-page brochure features three types of Kewanee steel door frames as well as steel baseboard and metal trim. Simple, fast installation procedure for the door frames is pictured and explained in detail. Specifications are included. Kewanee Manufacturing Company, Kewanee, Ill.

Materials handling equipment. A folder describes a line of loaders, tractor shovels and backhoes and several other types of equipment. Pictures and specifications are included. Henry Manufacturing Company, P. O. Box 521, Topeka, Kansas.

Grinding concrete. Specifications during recent years have called more and more for finely finished concrete surfaces on walls, columns, floors and ceilings. Special grinding equipment that will finish hardened concrete surfaces quickly and effectively has become necessary. This pamphlet gives information on the proper equipment and its uses, speeds, and accessories required. Stow Manufacturing Company, 443 State Street, Binghamton, New York.

Materials technology. A new quarterly publication, "Advanced Materials Technology" is available without charge to readers interested in technical information on materials to meet severe or unusual conditions in processing or operation, such as extreme heat, abrasive action, corrosion,

or other problems beyond the capabilities of conventional materials. The first issue gives data on a new self-bonded KT Silicon Carbide which provides high strength and other outstanding properties up to 4000 degrees F. Thermal shock problems are treated, as well as a new heating element and some of the new uses of zirconium. Another feature is a question and answer section on ceramic to metal bonds. The Carborundum Company, Niagara Falls, New York.

Calcium chloride solution. A folder tells how to prepare standard calcium chloride solution, how much solution to add per batch, and how automatic dispensers operate for uniform batching. Form No. Con15810, Calcium Chloride Institute, 909 Ring Building, Washington 6, D. C.

Forming equipment. Steel-ply and magnesium-ply forms for light commercial and residential work are described in an 8-page bulletin. Forming accessories are also included. Symons Clamp & Manufacturing Company, 4249 Diversey Avenue, Chicago 39, Illinois.

Steel strapping. Bulletin U7-2, perforated for permanent filing in a notebook, provides both diagrams of form construction and recommendations for strap placement and photographs of job-site applications of steel strapping. A general discussion of the use of steel strapping states that it is superior to clamps for reinforcing column and pier forms because it can be applied more quickly and with greater safety for workmen, and can be removed when the forms are stripped in much less time than is required for removing clamps. Since it is expendable no cleaning and storing is necessary. Acme Steel Company, 135th Street and Perry Avenue, Chicago 27, Ill.

Lift truck maintenance. Tips on the care and servicing of materials handling equipment are contained in a pocket-sized handbook. A check-list helps users avoid unnecessary repairs. A comprehensive maintenance program is outlined and Townmotor parts service, emergency service and lift truck reconditioning plan are described. Townmotor Corporation, Cleveland, Ohio.

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SEPTEMBER 1958

Literature

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mail cards facing page 18.

Catalogue of pumps. Complete descriptions of this firm's straight centrifugal pumps, self priming centrifugal pumps, rotary pumps, and accessories, along with instruction bulletins on installation and maintenance and price lists are included in an indexed catalogue. Good illustrations and clear diagrams accompany the descriptions. The complete catalogue is available, or contractors interested in a particular type of pump may obtain literature on it by specifying the type. Marine Products Company, 515 Lycaste, Detroit 14, Michigan.

Curing agent. A data sheet describes the application of Emeri-Crete Kure on new and old concrete floors. The material dustproofs and rejuvenates old floors or is useful as a curing agent and surface hardener on new floors. Specifications for applying and performance figures showing water retention, coverage and penetration are given. Time and cost factors are also discussed. Walter Maguire Company, 60 East 42nd Street, New York 17, N.Y.

"Moving Mountains." This 27-minute, 16mm. color and sound film portrays man's efforts through the centuries to improve and speed his ability to move goods and material. The role played by mobile materials handling equipment in freeing man from drudgery and toil is dramatized. The film is available without charge for showing and requests for its use should be addressed to Community and Industrial Relations Department, Clark Equipment Company, Buchanan, Michigan.

Two-way radio. Bulletin EOR 547A introduces this manufacturer's new line of transistorized two-way radio equipment. Transistorization provides greater reliability and less downtime, according to the bulletin. The equipment is designed for 12-volt systems and may be used with either positive or negative ground. Communication Products Department, General Electric, Electronics Park, Syracuse, New York.

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